

ALBERT R. MANN
LIBRARY

NEW YORK STATE COLLEGES
OF
AGRICULTURE AND HOME ECONOMICS

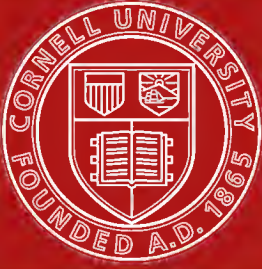


AT
CORNELL UNIVERSITY

CORNELL UNIVERSITY LIBRARY



3 1924 051 991 952



Cornell University
Library

The original of this book is in
the Cornell University Library.

There are no known copyright restrictions in
the United States on the use of the text.



HARDY WATER-LILIES

The true Water-Lilies are the most beautiful of all aquatic plants. There are many species, some of which grow only in tropical conditions, a few may be termed sub-tropical, whilst others are quite hardy in England, our own native species *Nymphaea alba*, of course, being among them. Tropical species are represented by white, pink, red, yellow, and blue flowers, but the temperate (hardy) Nymphæas were white, or white-and-red, until a few years ago, when seedlings or hybrids were raised by M. Latour-Marliac, a French nurseryman, some of which have crimson, others apricot, and others variegated flowers. Hitherto, however, no hardy Nymphaea with blue flowers has been obtained. Three of the best of the hardy seedlings are represented in the Plate. The species that were used in the breeding of these new hardy Nymphæas are known only to the raiser, but it is probable that *N. alba*, and the red-tinted Swedish variety of it, and *N. flava*, a yellow-flowered species from Florida, have played an important part in their origination. The hardiness, free-flowering habit, and pleasing colours of the new Nymphæas have won for them many admirers.

THE GARDENER'S ASSISTANT

A PRACTICAL AND SCIENTIFIC EXPOSITION OF THE
ART OF GARDENING IN ALL ITS BRANCHES

BY

ROBERT THOMPSON

OF THE ROYAL HORTICULTURAL SOCIETY'S GARDENS, CHISWICK

New York State College of Agriculture.
LIBRARY.

NEW EDITION

REVISED AND ENTIRELY REMODELLED UNDER THE DIRECTION
AND GENERAL EDITORSHIP OF

WILLIAM WATSON

CURATOR, ROYAL GARDENS, KEW

WITH CONTRIBUTIONS FROM

DR. M. T. MASTERS, F.R.S., EDWARD MAWLEY, F.M.S., G. MASSEE, F.L.S.

F. W. BURBIDGE, M.A., F.L.S., J. FRASER, F.L.S., J. J. WILLIS

R. LEWIS CASTLE, W. IGGULDEN, R. DEAN, J. HUDSON, J. DOUGLAS, W. J. BEAN
AND NUMEROUS OTHER EMINENT SPECIALISTS

ILLUSTRATED BY NUMEROUS ENGRAVINGS IN THE TEXT AND A
SERIES OF COLOURED PLATES

Divisional-Vol. VI

LONDON
THE GRESHAM PUBLISHING COMPANY
34 SOUTHAMPTON STREET, STRAND
1902

With regard to the Illustrations in Divisional-Vol. VI., special indebtedness has to be acknowledged to Messrs. Sutton & Sons, Reading, and to Messrs. James Veitch & Sons, Ltd., Chelsea.

CONTENTS

DIVISIONAL-VOL. VI

CHAPTER XXVII.—KITCHEN-GARDEN VEGETABLES	Page 389
NAMES OF CULINARY VEGETABLES IN ENGLISH, FRENCH, AND GERMAN	527
CALENDAR OF OPERATIONS IN THE FRUIT AND KITCHEN GARDENS	531
APPENDIX—	
On the Collecting, Storing, and Packing of Vegetables	561
INDEX	571

LIST OF PLATES

COLLECTION OF VEGETABLES -	390
CLIMBING FRENCH BEAN—Excelsior	452
COS LETTUCE—CABBAGE LETTUCE	456
MUSHROOMS IN A CAVE	464
ONIONS	468
ENGLISH-GROWN PINE-APPLES	534

COLOURED PLATES

HARDY WATER-LILIES—Carnea, Ignea, Chromatella
AUBERGINES OR EGG-FRUITS—(7 varieties)
ANTHURIUM SCHERZERIANUM

CHAPTER XXVII.

KITCHEN-GARDEN VEGETABLES.

The position, formation, and general treatment of the Kitchen Garden are dealt with in Vol. II. Chapter I. The present chapter deals with the plants usually grown in the Kitchen Garden and popularly known as Vegetables and Herbs. Tomatoes and Cucumbers, although classed as vegetables, have been dealt with in separate chapters.

The uses of the plants, their cultural requirements, and, in some cases, their preparation for the table are given. The list of varieties is in most cases distinctly selective. It is scarcely worth while to attempt to describe each variety for purposes of identification, but any decidedly useful and distinctive characters are given. Nor is it considered worth while to give the synonyms, in some cases very numerous, of the varieties. The names here preferred are those that are in general use among English cultivators and seedsmen.

CROPPING THE KITCHEN GARDEN.

It is well known that the same kind of crop cannot as a rule be successfully grown on the same ground for several consecutive years. Farmers know that if land be too frequently cropped with Clover, it becomes what is termed Clover-sick, and fails to produce good Clover till after a rest of several years. So much is this the case that in some districts two rotations intervene before the ground is again sown with Clover.

Various theories have been formed as to the causes which render the rotation or alternation of crops necessary. Some plants contain a greater amount of certain mineral substances than others; for instance, some require potash or soda, some lime, others phosphoric acid, others silica, and so on. This being the case, it is evident that it would be beneficial to cause one crop requiring only a small quantity of any particular inorganic substance, to succeed another requiring that substance in large amount. Such is the explanation of the beneficial results attendant on the rotation of crops, but in practice results at variance with its conclusions are sometimes obtained. Crops requiring a large amount of a certain mineral food are found to succeed if planted immediately after other crops that are known to require the same food in nearly equal quantities. More-

over, by merely restoring the inorganic matters abstracted from the soil by any crop, we do not fit it for the immediate production of other crops of the same kind.

The reader should refer to Vol. I. Chapter XIV. for information on Soil and its properties, tillage, &c.

The necessity of a change of crops, whatever be the reason, being undoubted, it remains to point out what are the general rules which are found the best in practice. These are as follow:—

1. Plants of the same natural order should not succeed each other.

2. Crops which occupy the ground for several years should be succeeded by others of short duration; thus, Asparagus or Strawberries may be followed by Cabbages or Lettuces.

3. Plants grown for their roots or bulbs should not be succeeded by others grown for the same purpose; neither should plants grown for their seeds follow each other.

The above rules apply to all systems of rotation, but it is impossible to recommend any particular course of cropping as the best, as this depends upon the quality of the soil, the manure at command, size of garden, and products required. The market-gardeners round London, who may justly be considered our best kitchen-gardeners, adopt no particular system of rotation. They manure highly, trench frequently, and plant any crop that is fit for planting out when the ground becomes vacant. In doing so, however, they follow, as far as practicable, the rules just given.

Two modes of cropping are adopted in gardens. The first may be termed separate cropping, the second simultaneous cropping. In the former, the ground is only occupied by one crop at a time; in the latter, by several. For instance, summer Spinach may be sown between the rows of Peas and Beans, Radishes along with Carrots, or Lettuces together with Onions, or planted between the rows of Celery, &c.

With regard to the comparative merits of these two modes of cropping there is much difference of opinion. The finest productions are undoubtedly obtained by the separate system; whilst a greater weight of produce of all sorts, but generally of inferior quality, is obtained by the simultaneous mode. To carry out the latter properly, the soil must be rich and frequently manured; whilst by the other mode, good vegetables may be grown without so much manure. On the whole, the separate mode of cultivation is best for large gardens; simultaneous cropping

for those of small dimensions; and in gardens of medium size both systems may, to a certain extent, be employed. Thus, succession crops of Spinach, Lettuce, Colewort, and Borecole may occupy the ground between other crops.

It is impossible to detail systems of cropping that would be applicable in all cases. Circumstances render the demand for any particular article exceedingly variable, so that no exact limit can be assigned to the quantity of ground necessary to be allotted to each. Again, the garden may be large enough to admit of several quarters being cropped with Potatoes; and in that case it would be proper to direct that Coleworts and Cabbages should be planted where the Potato crop has been cleared. But, should the garden be small, so as to render it advisable to grow only a few early Potatoes on some of the borders, other places must be found for the Cabbages.

Although directions cannot be given to meet all circumstances, yet it may be useful to point out such crops as may not inappropriately follow each other, either in the same season or in the one next ensuing. In most cases an ample choice will be found, so that, either as regards cropping the ground or producing successional supplies, no difficulty need be experienced.

BEANS may follow Borecole, Broccoli, Cabbages, Parsnips, Carrots, or Potatoes: between the rows may be planted Borecole or Brussels-sprouts. Beans may be succeeded by Celery, Leeks, Lettuce, Turnips, and any of the Cabbage tribe, especially when the ground in the previous year has not been cropped with any of these.

BEET may follow the Cabbage tribe, and any other crop except Spinach, Turnips, Parsnips, Carrots, Salsafy, and Scorzonera. Beet may be succeeded by Peas, Beans, Cabbages, Cauliflowers, Lettuce, or any other spring-sown crop, except Spinach, Turnips, Parsnips, and Carrots.

BORECOLE may follow Peas, Beans, Lettuce, and Potatoes. Between the rows Beans and Potatoes. May be succeeded in the following spring by Peas, Beans, Beet, Carrots, Parsnips, Onions, Potatoes, Celery, Kidney-beans, or any but the Cabbage tribe.

BROCCOLI may follow, in the same season, Peas, Beans, or Kidney-beans. Between the rows nothing. May be succeeded by any crop requiring to be sown or planted when it is cleared off, except the Cabbage tribe.

BRUSSELS-SPROUTS. Same as *Borecole*.

CABBAGES may follow or be followed by Peas, Beans, Kidney-beans, Potatoes, Lettuce,

Onions, and any other crop not belonging to the same order as themselves. Between the rows Coleworts.

CARROTS may follow or be followed by any but root crops, and Celery, and Parsley. Between the rows nothing.

CAULIFLOWERS. Same as *Cabbages*. Between the rows Lettuce, Spinach, Endive.

CELERY may follow any crop which is cleared off the ground in time, as it is dependent for nourishment on the fresh manure added in the trenches. Between the rows Lettuce may be planted. May be succeeded by Peas, Beans, Kidney-beans, Onions, Potatoes, Turnips, or any of the Cabbage tribe.

ENDIVE may follow Potatoes, Peas, Beans, the Cabbage tribe; but not Lettuce, Scorzonera, or other Compositæ; and with these exceptions may be succeeded by any crop suitable for borders or other situations where Endive is grown.

KIDNEY-BEANS. The same as *Peas*.

LEEKS may follow any crop but Onions, Garlic, Shallots, Rocambole, or Chives.

LETTUCE may follow Peas, Beans, Potatoes, the Cabbage tribe, and any other crop, with the exception of Endive, Chicory, Salsafy, Scorzonera, Artichoke, Cardoon, and other Compositæ.

ONIONS may follow the Cabbage tribe, Celery, Potatoes, Peas, Beans, Kidney-beans, and even Onions, where the ground has been highly enriched by suitable manure, and where the produce is obtained free from canker. May be succeeded, without any further preparation of the ground beyond surface hoeing and cleaning, by Cabbages or Coleworts.

PARSNIPS. The same as *Carrots*.

PEAS. The same as *Beans*.

POTATOES may follow any crop except Carrots, Parsnips, Beet, Salsafy, or Scorzonera. Between the rows Brussels-sprouts, Borecole, or Broccoli may be planted; or late Celery, if certain rows are left somewhat wider than usual to admit of a trench being dug between them. They may be succeeded by any crop requiring a loose, clean, well-worked soil.

SEA-KALE may follow Potatoes, or any except Cruciferae. May be succeeded by Potatoes, Peas, Beans, and others not included in the above exceptions,

SHALLOTS may follow Peas, Beans, Potatoes, Cabbages, and the like, also Lettuce, Endive, Spinach. May be succeeded by any crop except Onions.

SPINACH may follow Peas, Beans, Kidney-beans, Cabbage, Cauliflower. Lettuce, or any

other crop, Beet excepted. Winter Spinach may be succeeded by any spring crop.

TURNIPS. The same as *Carrots*.

It may happen that a crop may have to follow another of the same nature; such may be owing to limited space, or a backward season may render certain crops too late for being gathered in proper time for allowing the ground to be occupied by the usual succession. When this is the case, the ground should either be trenched or dug two spits deep and manured.

Quantities of Seed required for Cropping the Kitchen Garden.—A correct seed estimate can only be made from experience of the relative amount of each kind of vegetable required. The extent of ground to be cropped may be taken into consideration in connection with the greater or less demand for certain articles. In some families certain kinds of vegetables are in great demand, whilst others are scarcely asked for. The estimate must be framed accordingly. A few deficiencies may easily be made up in good time; whilst a slight excess is in most cases desirable, and even advantageous. Many kinds of seeds keep good for several years, and of these it is well to have a surplus; for if they prove true to their variety, a sowing can be made in the following season that can be depended on. The quantity of seeds required in general to crop an acre of garden may be estimated as follows:—

Peas,	8 qts.	Cress,	1 qt.
Beans,	3 qts.	Endive,	1½ oz.
Kidney-beans,	2 qts.	Leek,	1 oz.
Scarlet-runners,	1 qt.	Lettuce,	3 ozs.
Borecole,	1 oz.	Mustard,	1 qt.
Brussels-sprouts,	1 oz.	Onion,	6 ozs.
Broccoli,	2 ozs.	Parsley,	2 ozs.
Cabbage,	2 ozs.	Parsnip,	4 ozs.
Red-cabbage,	½ oz.	Radish,	1½ pt.
Savoy,	½ oz.	Spinach (summer),	1 qt.
Cauliflower,	1 oz.	(winter),	1 pt.
Beet,	2 ozs.	Salsafy,	½ oz.
Carrot,	6 ozs.	Scorzonera,	½ oz.
Celery,	½ oz.	Turnip,	4 ozs.

Alexanders (*Smyrniun Olusatrum*).—A native of Britain, formerly cultivated for its leaf-stalks, which, having a pleasant aromatic flavour, were blanched and used instead of Celery and in flavouring soups.

Angelica (*Archangelica officinalis*, fig. 1146).—A native of Britain. The tender stems, stalks, and midribs of the leaves are used in confectionery, candied with sugar. The seeds are used in flavouring. In some parts of the north of Europe the leaves are eaten either raw

or cooked together with fish or flesh. The plant is raised from seed sown in August or in March, and frequently watered, and grows well in any good soil, but succeeds best in a



Fig. 1146.—*Angelica* (*Archangelica officinalis*).

cool moist situation. Should be planted 2 feet apart each way. Will be fit for use in the following May or June. The stems should be cut down before flowering; the plants will then live for three years.

Aniseed (*Pimpinella Anisum*).—An annual, native of Egypt, cultivated in the Levant and in Spain for its seeds, which are employed in confectionery, in distillation, and for the manufacture of a well-known cordial. Is sometimes grown in this country for its leaves, which are used for garnishing and seasoning. It requires a light soil and warm situation, where it may be sown in April in drills 6 inches apart, and the young plants thinned to about 3 inches apart.

Artichoke (*Cynara Scolymus*).—A hardy perennial, native of southern Europe. Cultivated for its flower-heads, of which the fleshy receptacle, commonly called the bottom, and the base of the involucre scales, are the parts used (fig. 1147). Sometimes the central leaves of plants about to be destroyed are blanched, and used like Cardoons.

The Artichoke is by no means fastidious, but prefers a deep sandy loam and an open situation. The ground should be trenched 2 feet

deep and well manured with stable-dung. Sea-weed is an excellent manure for it, and salt is beneficial when the soil is not clayey.

Suckers.—From six to twelve suckers are produced by each stool. In April, as soon as the

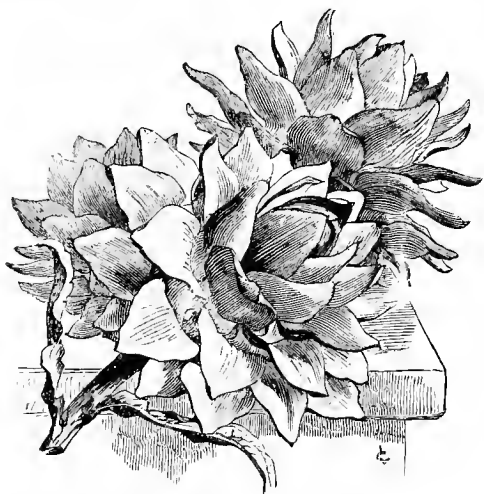


Fig. 1147.—Artichoke—Large Green or De Laon.

leaves are 8 or 10 inches in length, the stools are uncovered and the suckers slipped off with a heel, two or three of the finest being left on the parent plant. The suckers are then planted 4 inches deep, 8 or 9 inches apart, in clumps of three, placed 2 feet from each other, in rows 4 feet asunder. Water should be given till the plants begin to shoot. Where the ground is stiff, it is a good plan to dig a trench 18 inches deep, and fill it with a mixture of dung and mould, and in spring to plant on this. In the autumn of the year of planting, some heads fit for use will be produced.

Seeds (fig. 1148).—Globe Artichokes are easily raised from seeds, and strong plants can be had in one season. They cannot be depended upon to come true to name, only a small proportion of the seedlings being of any value. Some attain to great height and proportions, and produce numerous small flower-heads more nearly resembling Cardoons than Artichokes. Others are of little worth owing to the heads being thin and spiny. The seedlings worth saving grow with moderate strength, and

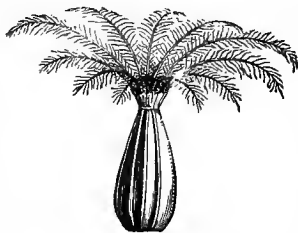


Fig. 1148.—Seed of the Artichoke (*Cynara Scolymus*).

give a good crop of massive heads with succulent scales. Seedlings are of good service in carrying on a supply till severe frosts intervene.

The seeds may be sown either under glass or in the open. Sown in a pan in February or March, and placed in heat to hasten germination, the seedlings quickly appear, and when fit should be placed singly in 4-inch pots in loamy soil and kept growing in heat till well established, when they should be hardened off in a frame before planting them out in April or May, 18 inches apart, in rows 3 feet asunder. Seeds sown in April in the open ground in shallow drills 3 feet apart, thinning the seedlings until eventually they are left 18 inches apart, if kept free of weeds by stirring the soil about them with a hoe, will produce good plants by August.

If the heads are required for pickling, they should be gathered when about 2 inches in diameter; if for the bottoms, when they are nearly full-grown and before the opening of the scales. As soon as the crop from each of the flower-stems is gathered they should be cut down; and all dead leaves should be removed at the same time. Any heads remaining in November may be preserved for a long time, by cutting them off with the whole of the stalk attached, planting the latter in moist sand in a shed or cellar, secure from frost, and cutting off, every three or four days, a small portion from the lower part of the stalk.

Towards the end of November, or before frost sets in, the extremities of the longest leaves must be cut off; the ground should then be forked over, but in doing this care must be taken not to injure the roots. After the ground has been forked, a good thickness of dry litter, fern-leaves, or other protecting materials, should be packed closely round the plants, but not over their heads. Before severe weather sets in the plants should be well covered overhead, but the covering must be removed whenever the weather is mild, and again replaced at the approach of frost. Towards the end of March, or as soon as all danger of severe frost is over, the protecting materials may be entirely removed; but if any of the plants have been partially blanched, as is not unfrequently the case, they should be gradually exposed to the light. Afterwards, when the leaves are 8 or 10 inches in length, the stools should be uncovered; and all the suckers, with the exception of two or three of the most vigorous, having been removed, but so as not to injure the roots of these, the earth should be again replaced round the plants. This

having been done, the ground may be forked over, a good soaking of liquid manure given, and, with the exception of keeping it free of weeds, nothing further is required till the plants come into bearing in June or July.

Artichokes may be forwarded somewhat by means of a framework and a covering of mats, and the season be prolonged in the autumn with similar aids. Every year, as the crop is gathered, the flower-stems should be cut down, as previously indicated; and the same treatment with respect to protection from frost, removing suckers, forking the ground, &c., should be pursued. After the second year, however, a quantity of well-decomposed dung or sea-weed ought to be forked in before winter. Notwithstanding the care taken in protecting the plants in winter, they are sometimes injured by frost. During extra severe winters the stock, if imperfectly protected, is frequently nearly all killed, and in this case the plan of lifting the survivors and starting them in heat with a view to obtaining a number of suckers for rooting in pots is to be commended.

Artichokes seldom continue in good bearing longer than four or five years; therefore a fresh plantation should be made every third or fourth year. As the plants in fresh plantations bear later in the season than those in old ones, some persons make a small plantation every year, with the view of prolonging the production.

If chards are required, when old plantations are to be destroyed, the plants should be cut over a little above the ground as soon as the principal part of the crop has been gathered; and when the leaves are about 2 feet high, they may be tied up and blanched like Cardoons.

In Italy, besides the head and chard, another product is obtained from the Artichoke; the stem is bent down at right angles, the leaf-stalks collected together, and the whole covered up to blanch. The result is a lump called *gobbo*, or hunchback, which is tender, and said to be very palatable when eaten raw with salt. It is used in autumn and winter as a substitute for Radishes.

Except in very warm seasons the Artichoke does not ripen its seeds in this country. If, notwithstanding this, an attempt to save seed be made, the heads should be sheltered from rain, either by gradually bending them down so as to throw off the wet, or by some other means. The seeds keep five or six years.

The varieties cultivated are:—

Globe (or Large Round-headed).—This has dull-purplish heads, with incurved scales, and is the sort most esteemed in this country.

Green (Common or French) has a conical or ovate head, with recurved scales.

Purple (Violet) has a medium-sized head, pointed scales, green tinged with purplish-red on the outside. Is earlier than the preceding sorts.

Several other varieties are described by French authors:—

Gros Camus has a large flat head, pale-green in colour, but less fleshy than some.

Large Green or *De Laon* (fig. 1147) is most esteemed and is largely cultivated in Paris.

Perpetual (fig. 1149).—Remarkable for its habit of growing and producing heads all the year round in



Fig. 1149.—Artichoke—Perpetual.

climates favourable to it. Is largely grown in the south of France. The heads are purplish.

Asparagus (*Asparagus officinalis*).—A hardy perennial, native of Europe and Asia. Gerrard says the manured or garden Asparagus is the same as the wild, but, like other vegetables, was made larger by cultivation; that it grows wild in Essex and in Lincolnshire, and in great plenty near Harwich. Phillips' *History of Cultivated Vegetables* says:—"It is well known how much the Asparagus is improved in size since Gerrard's time (1597), and it might be still further improved if our gardeners were to im-

port roots of this plant from the borders of the Euphrates, where it grows to an extraordinary thickness. Pliny states that *Asparagus*, which formerly grew wild, was in his time carefully cultivated in gardens, particularly at Ravenna, where it was grown so fair and large that three shoots would weigh a pound. It is naturalized in America, near the coast, most probably from seeds which have escaped from garden plants."

The plant consists of a cluster of fleshy roots springing from the base of the stem, where a quantity of buds are formed, from which shoots annually push, and these in their young and tender state form the edible part (fig. 1150).

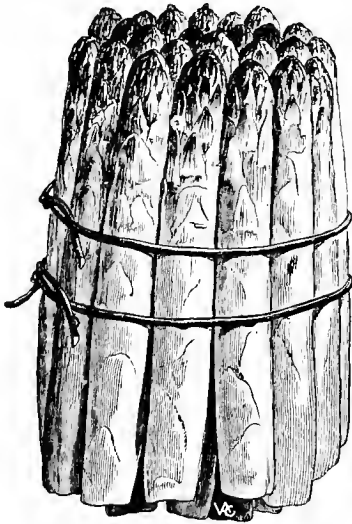


Fig. 1150.—*Asparagus*—Giant Dutch Purple.

The shoots, which are annual, attain a height of from 3 to 6 feet and bear numerous branches, clothed with small, linear, bright-green leaves. The flowers are small, star-shaped, and white, and the fruits are pea-like berries coloured bright red. Differences of soil, climate, situation, and cultivation have resulted in several recognizable variations, and it is probable also that seedling sports have been fixed. Accordingly there are numerous named sorts, the name usually indicating the district where the variety originated. The colour of the young stems depends greatly on the nature and texture of the soil; and with regard to size we may mention that in one part of Mr. Grayson's extensive plantations on the south side of the Thames the so-called Giant variety was produced, and in another part the common sort; but when both were made to change places, the common acquired the dimensions of the Giant, whilst the latter diminished to the ordinary size.

Propagation.—*Asparagus* seeds may either be sown broadcast on prepared ground, and the plants thinned out, or in drills in nursery-beds, where the plants can remain for one or two years before being finally planted out. The soil for the nursery-bed should be light, rich, and sandy. The seeds should be sown in drills half an inch deep in October, or in March or April. The seedlings should be thinned when they are 2 inches high.

Soil and Situation.—A rich sandy alluvial soil, impregnated with saline matters, is naturally best adapted for the growth of *Asparagus*, and in such soil its cultivation is an easy matter. Soils of a different texture may be made rich enough with manure; but whilst the soil retains too great a degree of stiffness, the results of cultivation will not prove satisfactory, nor will the produce bear comparison with that from soil naturally well adapted for the growth of the plant. The large *Asparagus* from Argenteuil is chiefly grown on a sandy loam, and by a peculiar mode of culture, which will be presently described, and the cultivators think that on soil of this character the shoots attain a greater size than on very light sandy ground, but are produced on the latter more abundantly.

The situation for *Asparagus* should be open to the sun, and sheltered from strong winds.

Preparation of the Beds.—The effectual drainage of the soil should be the first consideration; for although the plant grows naturally in salt marshes, and therefore cannot be said to dislike moisture, yet moisture, to be beneficial, must be accompanied with heat. If cold rains occur in spring, after the beds are warmed by the sun and are in full cutting, growth and production will be arrested; but warm rains later in the season are, on the contrary, favourable in both respects. The plant requires warmth in the soil, and undrained soil retains the coldness of winter.

The ground should therefore be drained, trenched, or made good to the depth of 3 feet, and a large quantity of manure introduced; also, near the top, such materials as the scourings of ponds or ditches, sea-weed, decayed leaves or leaf-mould, turfy peat, charred soil, decayed hot-bed dung, all of which are excellent. Heavy crops of *Asparagus* are grown where the bottom is a yellow, rather heavy loam, and the top has been made light from long working and plentiful manuring. In trenching for *Asparagus*, the heavy subsoil is neither turned up nor mixed with the upper soil, as might be advisable for some crops; on

the contrary, the lightest soil is kept uppermost, and made still more open by the addition of manure, sand, &c. Where the soil is not so deep, and the subsoil coarse and rather gravelly, the ground is trenched only one spit deep, the bottom of the trench being then merely dug over. Above this, however, a large quantity of manure is applied, and by this, together with good after management, chiefly consisting in making the soil fine and light for the shoots to push through, good crops are produced, but with greater care and expense than are requisite where the soil is naturally well adapted for the growth of the plants, that is, where it is loose and sandy.

Mr. Errington's method of preparing the ground for Asparagus was by cropping it with Peas, and when that crop was cleared off, Celery-beds about 4 or 5 feet wide were marked out and excavated to the depth of a foot, the soil being thrown out right and left; then 6 or 8 inches of half-decayed leaves and dung, chiefly the former, and which had been used as linings to pits or frames, was trenched in, at least a foot deep in the excavation. The surface was then covered once more with 3 inches of the best rotten manure, which, when spread, was forked in and duly mixed. The bed was then planted with Celery, and when this was taken up for use, the operation, with a little care, left the bed right for planting Asparagus in the following May.

Mr. Behrens, of Travemünde, near Lubeck, in the account of the mode in which Asparagus is cultivated in his neighbourhood, says: "It is never planted otherwise than in a deep, light, and sandy soil, which has been trenched to a depth of 3 feet, well drained, and well manured. A thick layer of horse-dung is put in the bottom of the trench, and mixed with the soil. Strong loamy or clayey soil is decidedly disadvantageous to the growth of this vegetable. The shoots are weak, they do not become tender, and they often become brown-spotted, especially if the drainage has been neglected."

Artificial Manures.—The effect of these on the growth of Asparagus is exceedingly variable, and is greatly influenced by the greater or less dryness of the season. This was proved by the following experiments with artificial manures.

The substances were applied to separate beds, the surface of each being equal to 100 square feet, or about 11 square yards, and the resulting growth was estimated by the weight of stems produced, as compared with that from

a bed to which no manure was given. The substances applied, their respective quantities, and the manner of their application were as follow:—

Guano and Salt: guano 10 ozs., salt 12 ozs., in 16 gallons of water, applied once a week, for 17 weeks. Total—guano, 10 lbs. 10 ozs.; salt, 12 lbs. 12 ozs.

Sulphate of Magnesia, applied at once, spread over the bed in the middle of June. Total, 20 lbs.

Sulphate of Magnesia, applied in 16 gallons of water, once a fortnight, commencing in the second week of July. Total, 18 lbs.

Guano, applied like the preceding. Total, 18 lbs.

Salt, applied at once in the middle of June, like the sulphate of magnesia. Total, 20 lbs.

Nitrate of Soda, applied at once, like the preceding. Total, 20 lbs.

The following table exhibits the increase or decrease per cent in the weight of stems produced, the comparison being made with the bed that had no manure:—

	First Year.		Second Year.	
	Increase.	Decrease.	Increase.	Decrease.
No manure, .....	...	...	...	...
Guano and salt,	51	...	...	...
Sulphate of Magnesia, applied at once,	44	...	43	...
Ditto, once a fortnight, ...	44	...	...	37
Guano,	42	...	6	...
Salt,	22	...	...	...
Nitrate of Soda,	18	...	84	...
	221	...	133	37

It will be seen from this table that the increase in produce of the manured beds, over that to which nothing was applied, was, on the whole, much less in the second than it was in the first year; the latter was a wet season, whilst the former was very dry up to the end of the growing season—a circumstance which will doubtless account for the difference between the results obtained in the two years. Sulphate of magnesia, applied at once, gave the steadiest results, being an increase of 43 or 44 per cent in both years.

Taking the average of the two years—

Nitrate of soda gave an increase of	51 per cent.
Sulphate of magnesia, applied at once	43½ "
Guano and salt	25 "
Guano	24 "
Salt	11 "

From the above it appears that common salt was inferior as a manure to the other substances employed. Of these nitrate of soda is at the head of the list, whilst salt ranks the lowest, the difference between the two being 40 per cent. It follows, according to the above experiments, that nitrate of soda should be employed in preference to salt. The latter, how-

ever, can always be readily obtained, and being of all artificial manures the one most frequently employed for Asparagus, it is necessary to say a few words respecting its application. It may be applied at the rate of 2 lbs. per square yard. This we consider a good dressing. The best time to apply it is in spring, before active vegetation takes place. It should be scattered over the bed, to be washed into the soil by the rain. Thus applied, it has the effect of ameliorating and rendering the soil more friable, so that the shoots can push through with facility. We have seen it more advantageously applied in this way than in repeated waterings with solutions. If weeds are troublesome, solutions, strong enough to kill them, may also be occasionally employed in summer. For this purpose, independent of its manuring properties, salt is very useful; and it is also particularly so for the destruction of wireworms and other pests which injure the roots of Asparagus, and ultimately kill the plant.

Salt should not be applied to clayey soils, as it causes these to "run" badly, lowering of temperatures and summer-cracking being the effects; nor to plants recently removed, for all such, however carefully transplanted, must have wounded roots; and it is doubtless to its application under these circumstances that the injurious results which have in some cases followed its use are to be ascribed. Again, salt should never be applied when the plants are dormant, as they cannot avail themselves of the nourishment it affords.

Planting.—According to the season, planting should be performed late in spring or early in summer. It should not be done whilst the ground is too cold, or before the plants begin to push. If possible, advantage should be taken of mild cloudy weather, when the air is moist; and the planting should only be carried on when the ground is in good working order. Planting was formerly done in March, but May has proved more satisfactory, some even preferring June.

It is stated by Mr. Fleming, as an instance of the success of late planting, that after having made a new plantation with the greatest possible care, about the middle of March, he found that many of the plants had perished after planting. It was June before he could take any decided step to remedy the evil; he then procured several thousands of two-year-old plants, took up those that had not died, and, beginning entirely anew, had the ground dug over again, and replanted with the fresh plants,

and although they had tops 8 or 10 inches high, scarcely one failed. "Many of the tops, indeed, withered and turned brown, but were in all cases succeeded by fresh growth. The plants were taken up carefully, the roots were immediately covered with moss, and kept moist till the moment of planting. In the course of the season the beds received several copious waterings with salt-water; and in the following spring, before the shoots made their appearance, the beds were sprinkled with salt sufficiently thick to make them white; the waterings with salt-water were repeated several times through the summer season, and by September the shoots were 5 feet high. Since the 15th of April we have gathered daily a good supply of fine shoots from these beds. It may appear that Asparagus planted in March, and having the whole season to grow in, must have a better chance of doing well than that which is transplanted in the middle of its growth; but I conceive that whatever advantages may arise from early planting are counterbalanced by the ground being cold and wet, and the roots of the plants being so tender that many of them perish before they start to grow."

In the Asparagus plantations near London the beds were formerly in general 3 feet, and the alleys 2 feet wide. At the present time, however, many beds 5 feet wide with 2-foot alleys are laid down. These widths we consider the best, and would recommend that in making a new plantation some of the beds should be 3 feet and others 5 feet wide. The reason for having some of the beds so much narrower than the others is, that the narrow ones are sooner heated by the sun's rays, and consequently an earlier production is induced.

The distance between the rows may be regulated as follows:—Where the beds are 3 feet wide, two rows may be planted along them, each row being a foot from the edge of the bed; the rows will consequently be a foot apart. In beds that are 5 feet wide three rows should be planted, one along the middle, and one on each side, a foot from the edge of the bed; the distance between the middle row and those on each side of it will consequently be 18 inches. The distance from plant to plant in the rows should not be less than a foot; at this distance good-sized heads are produced, but if very large heads are desired, the plants may be 15 or even 18 inches apart in the rows. The 3-foot beds should be traced out to run east and west, or so as to present the side of

the bed to the direct action of the sun's rays when they are most powerful. In this way they have greater effect than when the end of the bed is presented to their influence; and the consequence is, that the Asparagus pushes earlier in the season than it does in beds running north and south.

Except for the earliest beds the direction is immaterial, and they may run east and west or north and south as may be most convenient. In proceeding to plant, the beds and alleys should be marked off at the required distance. A stout peg or small stake should be driven in at each corner of the beds, and from these the distances for the rows should be measured. Some good cultivators near the Thames, where the soil is loose, sandy, and light, make the beds 6 feet wide, and instead of being level on the top, and trenches or alleys being cut down between them perpendicularly, or nearly so, the tops of the beds are rounded. Others have the beds 4 or 5 feet wide, with only one row of Asparagus, and a row of dwarf Kidney-beans about 6 inches from each edge of the bed. Mr. Errington set out his beds for two rows each, the rows 2 feet apart, with an alley of 4 feet between them. By this arrangement each bed occupied 6 feet. There are thus 2 feet between the rows, then a foot on each side of these, making 4 feet for the beds; leaving 2 feet for an alley and for soil for earthing up.

Where the soil is deep and easily worked and the sub-soil is sandy or gravelly, raised beds may be dispensed with and Asparagus be successfully grown on the level. This method is gaining favour among market growers who are unable to incur much expense in preparing the ground. Very poor ground ought to be bastard trenched and liberally dressed with farmyard manure, mixing the manure with both spits. If extra fine produce is desired, plant 3 feet apart each way, and crop lightly between with salading, Kidney-beans, Turnips, and such quick crops, till the Asparagus has attained something like its full dimensions. All things considered, it is best to plant 15 to 18 inches apart in rows 3 feet apart, and in the course of three or four seasons cutting may commence. Growing in rows admits of the crowns being easily moulded up with pulverized soil prior to active growth commencing in the spring; and this practice is desirable, as by far the best prices are obtained for stout shoots blanched to at least three parts of their full length. Dressings of manure or rich compost may, with advantage, be distributed along the

alleys formed by moulding up, and liquid manure can and should also be freely and frequently applied in the alleys.

There are various ways of planting; some cut out a trench, as if for laying box, deep enough to allow the roots to be spread out like a fan against the cut, the crown of the plant being kept 2 inches below the surface. Some dig out a trench, and at the proper distances form little hillocks of fine soil, over which the roots are spread. Others make a ridge, on the top of which they set the plants, spreading their roots on each side of the ridge; and again, some take off a portion of the soil of the bed, and after the surface has been raked smooth, the roots of the plants are spread out on the level. The position given to the roots by the last method is not natural, therefore we cannot recommend it, but any of the other modes may be adopted. In extensive plantations the first is generally practised, as it is the most expeditious, and answers very well; but whatever method be preferred, the crowns of the plants should all be on the same level, otherwise those that are too high would be liable to be injured by the knife in cutting.

Good plants one year old are generally preferred, but some employ two-year-old plants. They should be carefully taken up with a fork, and the roots preserved as entire as possible. It is a good plan to stretch the line precisely where the Asparagus is to be; a slanting cut to be made sloping from the line, about 9 inches deep, and a similar cut on the opposite side of the line, leaving a sharp and angular ridge, across which the plants are to be set astride; the operator, taking half of the roots in the one hand and half in the other, divides them across the ridge, at the distance of 12 to 15 inches between plant and plant. When finished they should be covered with about 3 inches of soil.

After-management.—During the summer and autumn the ground must be kept free of weeds, an occasional light hoeing accomplishing this, as it is of the greatest importance that weeds be never allowed to get the upper hand. A summer mulching of strawy manure acts beneficially, inasmuch as it conserves the moisture in the ground during dry weather and also tends to keep down weeds. In the autumn mark any blanks that may be found, with a view to re-planting, and when the stalks are withered cut down and burn them. Before active growth commences the following spring, very lightly fork over the ground, taking particular care not to disturb any roots or damage the crowns.

Treat as before during the next two summers, taking the precaution of lightly staking up any extra strong shoots that form—allowing these to be broken down by wind and rain, or even to blow about much, being a great mistake,—and in the autumn trim over the beds as before. It is unwise to commence cutting before the third or fourth year. If a start is made during the third year, only a few shoots should be cut, and those early in the season. By exercising a little patience at the outset the produce from the fourth year onwards will amply compensate for what may seem a long wait.

As Asparagus cannot well be grown too strongly, feeding from the surface should commence during the fourth season, and be closely attended to afterwards. The old-fashioned plan of giving a heavy autumn dressing of manure no longer meets with favour. Asparagus, unless actually on the surface, that is to say unduly exposed, is perfectly hardy, and is likely to be injured by a superabundance of solid manure. Chopping down the sides of the ridges and disturbing or breaking up the soil in the alleys again is a faulty practice, as it leads to the wholesale destruction of roots. A covering of about 3 inches of half-decayed manure acts beneficially in the case of light sandy soils, and this, in the spring, before growth commences, should be lightly forked over, all rubbish and stones being at the same time

The shoots are frequently spoilt by late frosts if the crowns are too near the surface. A covering of strawy litter over them is the best protection. Be careful not to top-dress with soil likely to contain seeds of weeds, nor to leave weeds on the beds long enough to seed, or much after-trouble and labour will have to be faced. In the autumn, wait till the tops are quite dead before cutting them down, and with them clear away any large weeds that may be found.

Asparagus is extensively grown at Argenteuil, near Paris, for the markets of that city, and their Asparagus has become famed for its great size and excellent quality. It must be remembered that in general the object is to grow large stout shoots perfectly blanched, with the exception of the tops, which should be rose-coloured, red, or violet; but by allowing the shoots to remain longer uncut, or to be more exposed to the light, a greater amount of edible shoot can be secured.

The system is in one respect directly the reverse of that usually followed in England—the Asparagus is planted in trenches instead of in beds. It is also frequently planted at wide intervals among the Vines in vineyards. At the beginning of winter the ground is dug 16 inches deep, and in February the ridges and trenches are lined off, if possible so as to run north and south. The first triangular ridge is only half the size of the rest, being 14 inches wide at the base, and 6 inches high. Two feet from the inner side of the base of this ridge a line is stretched, and a second line at 2 feet 4 inches from it, giving the base of the first full-sized ridge. This is to be a foot high. The whole of the ground is thus marked out in 2-foot trenches and 28-inch wide ridges alternately, the soil from the trenches being of course used to raise the ridges. The soil thrown up is intended to cover the shoots in the third year, previous to the first cutting, and, the same thing being repeated in the succeeding year, at the end of the fifth season the ground will be level. (See fig. 1152.)

Planting is done in March or April. Holes 8 inches in diameter and 4 deep are made a yard apart along the middle of each trench, the earth in the centre of the hole being formed into a hillock 2 inches high on which the roots of the plants are spread out equally in all directions. They are covered with $\frac{1}{2}$ inch of soil, then with

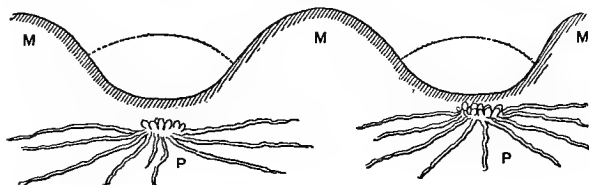


Fig. 1151.—French Method of planting Asparagus. M, Mounds; P, Plants. Dotted lines show method of earthing-up.

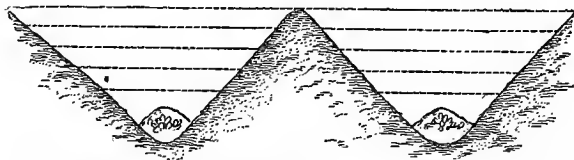


Fig. 1152.—Another Method of Earthing-up Asparagus. The dotted lines show the 4-inch layer of soil placed in the furrows over the plants each year.

raked off and cleared away. In the case of heavier soils it is sufficient to loosen the surface of the beds in the spring, following this up with a top-dressing of light sandy soil and guano, or sulphate of ammonia or magnesia.

If long, partially-blanchéd shoots are desired, mound up over the crowns with fine light soil.

two handfuls of well-decomposed manure, and finally with an inch of soil, making a little hillock an inch high over each stool, and putting in a stick to mark the place of the plants, and prevent injury to the roots in hoeing.

In October the stalks are cut off at 6 inches from the surface, the surface cleaned, the ridges dug a foot deep, and the plants manured. The roots having been carefully uncovered with a hoe over a circle 8 inches in diameter, one or two handfuls of well-decayed dung are placed over every crown, and covered with about 3 inches of light soil, raising a hillock 2 inches high over each, and marking any vacant places with a small stick.

In the second year the failures are replaced in March or April, using strong one-year-old plants, and stakes 3 feet long are pushed in slantwise at an angle of 45° near each plant. The ground is hoed at the beginning of April, and as soon as the shoots are large enough they are tied to the stakes to prevent breakage by wind. In October the withered stalks are cut off 8 inches above the ground, the ridges manured and dug over, and the stakes removed. The crowns are uncovered down to the manure, the soil about them loosened by the hand, and two inches of soil put on, always forming it into a conical mound.

In the third year, about the middle of March, mounds from 6 to 8 inches high are formed over each crown, according to its strength, but the plants used to fill up blanks are only covered 4 inches deep, and are afterwards left alone. In taking the shoots for use they are removed with the fingers so as to avoid injuring the stool, an asparagus knife only being used, if at all, to remove the earth and trace out the base of the shoot. The shoots are taken when 2 inches above-ground, by passing one finger behind their base, and, by pressing the shoot aside, it is easily detached. The soil is then returned. At most only three or four shoots are taken from each stool. In April, stakes 4 feet 3 inches long are put in, and the stalks tied to them, and in October the withered stems are cut over 10 inches above the surface, and cleared entirely away, the ground cleaned, and a good dressing of manure given. In doing this the soil of the trenches is entirely cleared out to the depth of 4 inches, casting it on the ridges; it is replaced with half that depth of well-rotted dung, the withered stems are shortened, except one, which is left to show the position of the stool, and, after digging the ridges, the manure is covered with about $1\frac{1}{2}$ inch of soil, at the same time

raising a mound of 3 inches high over each crown, and marking with a stick any that are weak.

In the fourth year, mounds 10 or 12 inches high are formed over each plant, but the weak stools marked in the previous autumn are only covered half that depth. In May, when the ridges are hoed, some earth is drawn into the trenches, and stakes 4 feet 9 inches high are put in. In October the stems are cut over at 14 inches above the ground, the ridges are manured and dug, the mounds in the trenches levelled, the soil in the trenches thrown out as in the previous year, some handfuls of well-decayed manure placed over the crowns, and mounds 3 inches high raised over them.

In the fifth year the mounds are raised in March to about 14 inches high. The whole of the shoots of the strong stools are taken for use, but only a few from those which are weak. The shoots are removed for about two months daily, every second day, or every third day at most, according to the temperature, and when showing about 2 inches above ground, and of a red or violet colour. The plants are staked and securely tied, and in October the stems are cut over, the soil of the mounds thrown on the ridges, the trenches manured as in the third year, the ridges dug, and the manure covered.

In the sixth year the Asparagus will be in full production; it is mounded up 14 inches high from the crown, and the autumn treatment is the same as in the fourth year.

Cutting the Stems.—In doing this a little of the soil is taken from beside the shoot with the Asparagus knife, which is then pushed down, but so as not to endanger the crown, or other shoots that may be pushing up, then turning



Fig. 1153.—Asparagus Knife.

the edge of the knife towards the shoot, the latter is cut, or rather sawed off. It is the practice near London to cut off all the shoots as they appear, up to the period when it is thought proper to leave off cutting altogether; the period for doing this depending on the climate, season, nature of the soil, and strength of the plants. Where the climate is good, or when the season is an early one, cutting must commence early; and of course, in that case, it ought not to be continued late, otherwise the plants will be weakened. When green Peas can be had, Asparagus is less required; so that, in the southern parts of the kingdom, the cutting may cease

towards the middle of June, and in the northern parts by the end of that month. If the plants are weak, they ought to be allowed to grow up as early as possible to make foliage, and consequently fresh roots, and thus to acquire more vigour for the ensuing year. It is also advisable to leave off cutting, at an early period, some of the best of the beds formed for early produce, in order that the shoots may be well matured early in autumn; and consequently that the young shoots may be prepared to push vigorously early in spring.

Duration of the Plantation.—Asparagus beds in favourable soil will continue to bear well for many years if properly managed, especially as regards cutting; but if too severely cut they will soon become unproductive, however well they may have been originally formed, or however good their treatment in other respects. By continually cutting off all the shoots throughout the season, as they appeared, the plants would be completely destroyed, just as the most obstinate weeds would ultimately be if so treated. If a strong Asparagus root were allowed to mature all the shoots it produced, these of course would return organized matter for the formation of still finer buds, and production of a proportionate quantity of fresh roots. But if all the shoots are cut off as they appear, except one, perhaps, late in the season, sap cannot be elaborated for the proper maintenance of the whole of the roots, and consequently a portion of those least in connection with the shoot which is left will perish. If the same severe process of cutting is pursued the following season, the plant is almost certain to succumb. When blanks begin to appear in beds, the latter should in future be more sparingly dealt with. There is only one case in which severe cutting is excusable, and that is when a piece of Asparagus is about to be thrown up, then market-gardeners and others cut as long as the produce pays for the trouble of cutting.

The duration of Asparagus beds mainly depends on the manner in which cutting is conducted. If carefully done, the beds may continue in good bearing for fifteen or twenty years, and even longer. It should, however, be remembered that to have fresh beds in bearing condition to supply the place of those past good yielding, four or five years must elapse from the time of sowing, and therefore it is not good practice to unduly delay the starting of new beds.

Seeds.—Some of the finest shoots which push in the early part of the season, and on the south

sides of the beds, should be allowed to run up for seed. As the stems grow up, some of the most promising may be tied to stakes to prevent breakage by the wind; but in doing this care should be taken not to crowd the branches, in order that the foliage may be exposed to the light as freely and equally as possible. With the growth of plants so reserved, that of others adjoining should not be allowed to interfere. When at maturity the largest of the red berries should be selected. After lying a week or two they may either be squeezed between the hands, and the seeds washed from the pulp, or the berries may be dried, in which case the seeds will keep the longest.

Forcing Asparagus (Figs. 1154).—This is an industry of some importance in the neighbourhood of Paris. It is also practised in a few

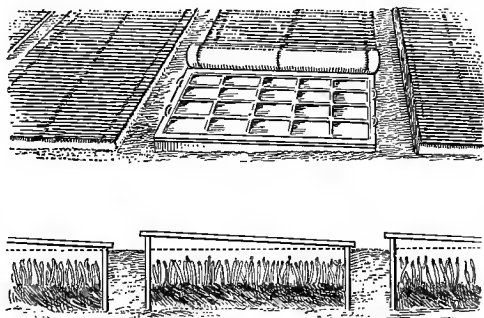


Fig. 1154.—View and Section of Frames for forcing Asparagus (French Method).

gardens in this country. The following account of the French method of forcing is taken from Robinson's *Parks and Gardens of Paris*:—"The forcing alone of Asparagus throughout the autumn, winter, and early spring is an industry of considerable extent. In one of the most recently-organized and active of these gardens about half an acre of glass is devoted solely to the forcing of Asparagus, and a supply is obtained from early in September to the end of April. It is forced in three ways—in houses heated with hot water; in frames in the ground and heated in the same way; and lastly, in frames covered with stable-manure. It appears to be forced with equal success in each case, though the stable-manure seems to offer the simplest means. As usual here, the frames are small, about 4 feet wide; the roots are placed directly on the manure, not flat, as they would be in the open ground, but packed as closely as possible, from 500 to 2000 plants, according to size, going under one light. A mere sprinkling of soil is placed over them. As

a result the shoots come up very thickly. The plants are strong ones, three years old; as many as five crops of roots follow each other throughout the autumn, winter, and spring in the same frame. The universal straw mat is used to cover the frames at night."

The old mode of forcing *Asparagus*, still practised to some extent, chiefly consists in digging deep trenches between beds planted for the purpose, covering the beds with the soil and with frames, filling in the trenches between the frames with stable-manure, and protecting the frames with straw mats and litter to keep in the heat. In the beginning of November the pathways between the beds of *Asparagus* are dug up about 2 feet in depth and width. The soil coming from the pathway is divided very carefully, and put about 8 inches thick upon the surface of the bed. The trench is filled up with new stable-manure, not litter, and frames placed on the bed. The manure should rise as high as the top of the frames, and the lights be entirely covered with mats and litter to prevent the accumulated heat from escaping. The sashes are put on, and no air is given; on the contrary, they are covered at night with straw mats, and also during the day in cold weather, a temperature of from 60° to 75° being considered desirable. We should, however, prefer starting with a temperature of between 50° and 60°, as is done by means of hot-water pipes in the Royal Gardens at Frogmore. The heat may be increased so as to range between 60° and 65°, or not exceeding 70°; for it is found that when *Asparagus* is forced too rapidly it is not so good as when it is brought forward gradually, with a temperature resembling that of a very fine May. Where glass is used, a good deal of sun-heat may be economized by keeping the sashes closed till the shoots appear. In the open air the finest and most tender shoots are produced in beds that have been exposed to powerful sun-heat.

In about a fortnight or three weeks the *Asparagus* begins to show itself on the surface of the bed. Many market-gardeners cover the whole of the bed inside the frame to a thickness of 3 or 4 inches with manure to force the vegetation more quickly, but in this case the manure must be removed when the *Asparagus* begins to shoot. When the shoots are about 3 inches out of the ground they may be cut. The mats must be taken off in the day-time, but the heat must be well kept up, or the roots and buds will fail to push. The beds are forced every second year only. The gathering

of the *Asparagus* may continue for about two months, but no longer, or the plantation would be injured. When the gathering is over, the frames and linings may be taken away, and the soil which has been dug up from the alleys put back again.

When the trenches are partially filled up after forcing is over, and the dung turned out, the roots strike into the decaying substances usually employed, so that when the beds are again about to be forced, these roots are destroyed in clearing out the trenches for the reception of the dung, and they are generally the most vigorous. This proceeding, in fact, deprives the plant of its most efficient feeders at the time they are most wanted. It is better to keep the trenches open, so as not to encourage the roots in that direction. In this case it would be well to cover over the trenches, in order to prevent the soil of the beds from being dried. In some instances the sides of beds intended to be forced by dung-heat have been faced with bricks in the pigeon-hole fashion, and where the expense can be afforded, this plan answers very well.

In some places it is difficult to procure dung for the purpose of forcing, and in any case it is doubtful whether heating by hot water is not cheaper in the end. The labour required for working dung linings is very considerable, and would go far towards defraying the expense of fuel. At all events the hot-water mode answers well where it has been adopted, as, for example, in the Royal Gardens at Frogmore. The beds there are 75 feet long and 7 feet wide; their sides are formed with pigeon-hole brickwork, and the spaces between the beds are 4 feet deep; but the lower half is filled with rich soil, and in the upper half there are a flow and a return pipe for hot water, connected with a boiler which heats six ranges of flow and return pipes. The cavities for the pipes are covered with Yorkshire stone, and the beds themselves with a close-fitting wooden roof. Some think 7 feet too great a width for the beds; we should recommend 6 feet; and where such substantial covering as Yorkshire stone cannot be afforded, wooden covers will answer the purpose. At Frogmore forcing is usually commenced in December, and a supply obtained in about a month. A little air and light, when the shoots begin to reach the surface, much improve their flavour and appearance. In every case avoid forcing every growth out of the crowns, as it is important that the plants should grow as strongly during the summer as those not forced. Do not wholly withdraw all the protective

material directly forcing ceases, but keep the beds littered over till all danger from severe frosts is passed. These forced beds should also be very liberally treated as regards manuring, abundant supplies of liquid manure during the growing season doing excellent service.

Forcing Removed Plants.—As yet there are few places where Asparagus in permanently planted beds is forced, the more convenient practice of lifting and forcing plants prevailing. Nor do many growers prepare a stock of plants specially for forcing, probably because this cannot well be done under two or three years. Those, however, with plenty of garden room would do well to prepare a few thousand plants for forcing, as the produce from strong young plants is usually very superior to that obtained from old plants. Ground that would grow good Potatoes would suit Asparagus. Either sow the seed thinly in drills 30 inches apart, eventually thinning out to a distance of 9 inches apart, or else plant 1-year-old roots at the same distances apart. Keep them free from weeds, mulch before dry hot weather is anticipated, and then nothing but poverty at the roots will prevent a strong growth.

In most large gardens a fresh bed is formed every spring, the oldest bed being broken up for forcing. If the beds are well prepared, and fresh sites chosen each time, this gradually brings a garden into a highly cultivated state.

The plants for forcing should be carefully lifted, enough being taken to fill a two-light or three-light frame, or the same number of lights in a pit to be forced at one time, unless a large supply is wanted at any particular date, in which case a period of from 15 to 30 days, according to the time of year, should be allowed, a close succession to be kept up by means of fresh relays of plants every fortnight or three weeks. Seeing that it is impossible to lift when the ground is frozen, severe frosts should be anticipated either by lifting a good supply of plants and storing in fine moist soil under cover or else by covering the beds with strawy manure. Asparagus forces readily in pits, bottom-heat being afforded by a gentle hot-bed of manure and leaves, and top-heat by means of hot-water pipes. It can also be forced successfully in ordinary frames on mild hot-beds. Keep the lights close, and mat over heavily till the shoots are coming up freely, when a little light and air during mild days should be admitted. Force all the growth out of the plants, and then throw them away as being no longer of any value. Divide the shoots into grades, mixed bundles

not finding favour. The smallest shoots may be used in soup-making.

Green or even blanched Asparagus may be produced in any forcing-house, in a temporary pit formed of wood, or in boxes. The latter may be made so as to rest one above the other, in order to occupy comparatively little base room. They may be 2 feet wide, 3 feet long, and 1 foot deep, with an upright 20 inches long secured inside the box in each corner. The uprights, standing 8 inches above the upper edges of the box, will serve as posts for supporting another similar box, and leave space for the growth of the shoots and for cutting. In this way four or five tiers may be placed along the back wall of a vinery or other forcing-house at work.

Insects, &c.—See chapter on this subject.

Leaf Enemies.—Garden Pebble Moth.

Balm (*Melissa officinalis*).—A hardy perennial, native of south Europe. Its young shoots are sometimes employed in salads instead of Parsley. It is also used for making a decoction known as Balm-tea.

It prefers a light warm soil, and is propagated by division early in spring. The subsequent culture is confined to keeping the ground free of weeds, and stirring it occasionally; the stems should be cut down when frost sets in; by these means the plants will remain vigorous for many years. When coming into flower some stalks should be gathered and dried for winter use.

Basil (*Ocimum basilicum*) (fig. 1155).—An annual, a foot high, native of India. The aro-



Fig. 1155.—Basil.

matie leaves are used in soups, &c., and occasionally in salad; but their strong flavour is disagreeable to some persons.

The BUSH BASIL (*O. minimum*) is smaller and rather more hardy than the first. They are both raised from seed, which should be sown in gentle heat in March, and the young plants thinned out to about 3 inches apart. Plenty of air and frequent waterings should be given in mild weather, transplanting them to the open ground in May in a warm border. The larger sort may be planted 6 or 8 inches from plant to plant, in rows a foot apart, and the smaller one 5 or 6 inches apart, in rows 9 inches asunder.

Bean (*Vicia Faba*).—A hardy annual of obscure origin, but possibly Egyptian; at any rate it is known to have been cultivated by the ancient Egyptians, and also in Europe in prehistoric times. It is now largely cultivated in most civilized countries, and is popularly known as the Broad Bean.

Soil.—The Bean has a long tapering root, extending downwards in a perpendicular direction to a considerable depth. Shallow soils are therefore not well adapted for it. That which is most suitable for the main crop is a deep, well-drained, rather strong loam; but for the first crops a light warm soil should be chosen. It has been found by analysis that the Bean contains a large amount of nitrogen; hence a soil rich in decaying animal or vegetable matter is most suitable for them.

Manures.—As Beans in garden culture are gathered young, it is obvious that manure ought to be given so as to be serviceable to the plants at an early stage of their growth. Lime, marl, gypsum, superphosphate of lime, bone-dust, wood-ashes, and burned clay will each and all prove highly beneficial to Beans on soils that have long been under cultivation and manured with organic manures. As lime and gypsum require a considerable time for solution, they should be applied in the autumn, and the other manures in spring. Although farm-yard manure may in general be the best manure for Beans, yet in cases where the ground is already rich in organic matter, its application will not be attended with such good results as would follow the use of lime, potash, magnesia, soda, &c. On the other hand, when the soil is deficient in vegetable matter, but abounds in mineral substances, the application of such will not be so beneficial as that of organic manures.

Seed Sowing.—Beans are generally sown in drills, 2½ feet apart and 3 inches deep. The seeds should be placed singly, 4 inches apart in the drills, and then covered with soil, which should be made firm. Many cultivators sow

the seeds in double drills, 6 inches apart, the rows being not less than 3 feet apart; or the seeds may be planted with a dibber.

When the plants are about 6 inches high they should be earthed up. When they have formed pods on the lower part of the stem, they should be topped; this checks the upward growth, and causes the pods to swell. This operation is likewise beneficial in relieving the plants from the destructive ravages of the *Aphis fabæ*, which infests the top part more especially. The tops when cut off should therefore be buried or burned.

Instead of placing the seeds at equal distances in a line, some plant them in patches a foot apart, and three or four seeds in each patch. In this way, by tying a strip of matting round the plants forming each patch, the stems are not so liable to be broken by the wind as they are when standing in rows, unless supported by twine stretched from end to end of the row.

To obtain an early supply, such sorts as Early Longpod or Early Dwarf Prolific should be selected, and sown on a warm border in front of a south wall or close hedge. A small sowing may be made in the end of October or beginning of November, and another in December for succession. If the winter is mild, the plants will require little or no protection; but if likely to be severe, a covering of litter or leaves, or a mixture of both, should be put between the rows to keep the ground from freezing.

Beans transplant well, and their safety through the winter may be ensured by sowing them in November or December, in rows from 4 to 6 inches asunder, in light soil and in a warm situation, where they can be easily protected by means of frames, straw-screens, mats and hoops, or similar contrivances. In protecting, care must be taken that the plants do not suffer from want of air and light. They will be fit for transplanting into a warm border on a mild day in February; or the plants could be raised singly in small pots early in February, and placed in gentle heat to germinate, hardening them off before they become root-bound, and planting them out on an early and favourable opportunity. Most cultivators defer making their first sowing until early February, and if possible a warm border is selected. The seeds should be planted in rows not more than 2 feet asunder, and fully as deep in the soil as they were before removal, afterwards drawing a little earth to the stems, and topping, as previously directed, for the main crop.

Windsor, Green Windsor, and Long Pod may

be sown in March for the principal crop, and again in April and May for succession. For a late crop, Long Pod and Dutch Long Pod should be sown in June or the beginning of July.

To obtain a very late crop, after gathering the summer produce of the Long Pod in a young state, let the soil be well watered, if dry, and in two or three days after the watering let the stems be cut down to within a few inches of the ground. Fresh shoots will soon push, and a better very late crop will be produced than if seeds had been sown late for the purpose. If a late crop is a very special object, then the plants intended to produce it should be cut down when in flower.

Steeping the Beans in water before sowing accelerates their germination, and plants from steeped seeds maintain their superiority over those from seeds not steeped, all other conditions being the same.

Gathering.—Some prefer Beans when very young, or when they have attained only one-fourth of their natural size. They should at all events be gathered before they appear black-eyed, that is, black at the hilum, or point of attachment to the pod. A portion, however, should be allowed to get older, in case they should be wanted for soups.

To save Seed.—The sorts of which seeds are intended to be saved should be sown in the end of February; and as the best seeds are those in the first-formed pods, none of these should be gathered for cooking green, although those produced afterwards near the top may be taken with advantage to those which are left below to ripen. When the leaves become withered and blackish, the stems should be pulled up, tied in small bundles, and set upright, where they will dry by exposure to the sun and air. The seeds will keep good for two years, after which time they are not to be depended on, though some will retain their germinating powers for five years or more. Seeds that have been long successively saved from plants grown in the same soil and situation are liable to degenerate. It is therefore advisable to obtain a supply occasionally from a different soil and climate.

Insects, &c.—See chapter on this subject.

Fruit and Seed Enemies.—Bean Beetles, Mice.

Leaf Enemies.—Black Aphis, Pea and Bean Weevils, Silver Y-moth. *Root Enemies.*—Mole Cricket.

Beck's Dwarf Green Gem.—Stems 1 to 1½ foot high, branched, compact in growth; pods small, abundant, clustered, 3 inches long, containing about three small fine green Beans. A most prolific variety, later than Longpod, very desirable for small gardens.

Green Longpod.—Stems 3 to 4 feet high; pods 4 to 5 inches long, mostly erect, generally containing about four oblong Beans, which when fit for use are bright-green. Much valued for their green colour when cooked. A good bearer.

Hardy's Pedigree Windsor.—Stems 2 to 3 feet high, robust; pods 5 to 6 inches long, containing about three large flat Beans, produced abundantly and generally curved downwards like the Longpods, between which and the Broad Windsor it seems to be intermediate. An excellent sort, very productive.

Longpod.—Stems 2 to 3 feet high, of free growth, branching at the ground and producing from three to five stems; pods 7 inches long, containing from three to five medium-sized Beans of good quality. It is prolific and early.

Seville Longpod.—Stems 2 feet high, sparingly branched; pods often 7 to 9 inches, containing about six Beans of excellent quality; the pods are rather sparingly produced. One of the earliest.

Sutton's Green Giant (fig. 1156).—A green-seeded counterpart of Longpod, and one of the most remarkable and

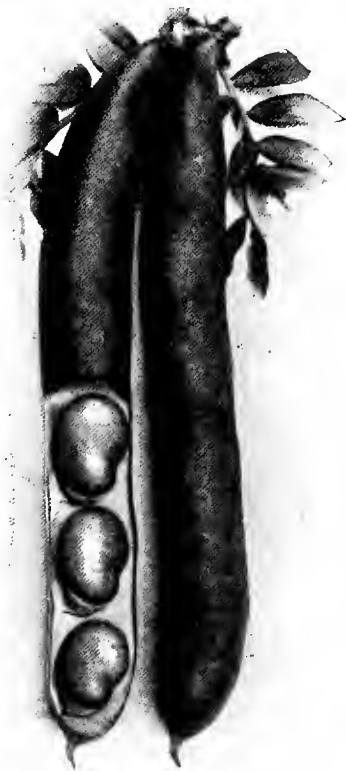


Fig. 1156.—Bean—Sutton's Green Giant.

popular Beans ever raised. Has long straight pods, and Beans excellent in flavour.

Violet.—Stems robust; pods 6 inches long, containing from three to four fair-sized oblong Beans, of a pale-red colour, dull-violet when ripe. An excellent Bean, coming into use three days later than the Longpod, but the colour of the skin is objectionable.

White Fan.—Stems 1½ foot high, robust, much branched; pods abundant, produced in erect clusters from the very surface of the ground; 3 to 4 inches long, and containing

about four fair-sized oblong Beans. An excellent and most prolific variety, coming into use two days after the Longpod.

Windsor (Broad Windsor).—Stems 3 to 4 feet high, branched, robust; pods 4 to 6 inches long, $1\frac{1}{2}$ inch broad at the lower end, much curved, containing two or three very large roundish flattened Beans. An excellent sort, the best for a summer crop. *Green Windsor* has the habit of the Windsor, from which it is distinguished by the Beans being of a green colour.

Beet-root (*Beta vulgaris*).—A hardy biennial, native of the sea-coast of the south of Europe. "Its cultivation does not date from more than three or four centuries before the Christian era. The red and white roots were known to the ancients, but the number of varieties has greatly increased in modern times, especially since the Beet-root has been cultivated on a large scale for the food of cattle and for the production of sugar. It is one of the plants most easily improved by selection, as the experiments of Vilmorin have proved" (Decandolle). According to Mr. Barr's observations the purple-fleshed sorts are the richest in flavour, the crimson-fleshed sorts being also good, and those with scarlet flesh contain the least saccharine.

Beet-root requires an exposed situation, for, however good the soil may be, it will not thrive if shaded by trees. A tolerably rich open loam, or a sandy loam, produces the cleanest roots and the best crops. Ground that has been manured for a previous crop will not require to be again manured for Beet-root. It should, however, be trenched in winter two spades deep, throwing the soil in ridges in order to expose it to the action of the weather. Advantage should be taken of dry weather to level down the ridges, and dig the whole regularly over just before sowing.

If manure is necessary, it should be applied in trenching, putting it down a foot or so below the surface, an early contact with solid manure causing the top roots to fork badly. Salt has a decided effect in promoting the growth of Beet; but it should only be applied in moderate quantities, as both it and ammoniacal manures, when too liberally given, have the effect of increasing the bulk of the produce at the expense of its quality.

In most localities the main crop may be sown about the third week of April. The precise time, however, depends on the soil and situation. In some soils the plants are apt to run to seed in the same season; the sowing should therefore be made later than where the plants are not subject to run. The market-gardeners near

London sow their Beet in the first week of May; for if sown as early as some recommend, the roots become too coarse, and are not so tender as those sown later. On the other hand, it may be sown too late to acquire its proper size and flavour. In gardens where early crops must be raised, it will be advisable to sow some early kind, notably the blood-red form of Turnip-rooted, at the end of February, or in the first week of March; or at this time plants for transplanting may be raised in a frame, where the heat is very slight. For succession, a few more rows, according to the demand, may be sown at the end of March.

The seeds should be steeped in water previous to sowing, and sown whilst still damp, in drills $1\frac{1}{2}$ inch deep; these for the smaller kinds should be about 12 inches apart; and the plants should be thinned out to 8 inches apart in the row. The large sorts may have 15 inches between the rows, but still not more than 8 inches from plant to plant in the row.

When the plants are 2 inches high, they should be thinned; and when they have made six leaves, again thinned to the proper distance. At this age the thinnings may be used for filling up any blanks in the rows. Great care should be taken not to break the roots in removal, and the principal one should be inserted at full length, and without doubling. This should be done in cloudy weather, and when the ground is moist but not wet. The ground should be frequently stirred during the summer, and watered when necessary.

The crop will continue to grow till checked by frost or cold weather. Part of it should be taken up not later than the beginning of November. To do this, a trench must be opened along the first row to be taken up, to the full depth of the roots; from these the earth should be carefully removed, in order not to break the fibres, for loss of colour will result from their being broken. The tops should be trimmed before the roots are stored. This is done by laying them slanting among moderately dry soil, so that the herbaceous part only of the crown may be exposed. Some being taken up in case of severe frost, means should be adopted to protect those remaining in the open ground, which have a much fresher flavour than those which are housed. Beet that has been frozen is practically spoilt. If, therefore, any are left in the open after the middle of November, they ought to be well banked over with fresh leaves or litter, upon which a layer of soil should be placed to effectually protect the roots.

To save Seed.—Sow in an open situation a row, or part of a row, according to the quantity required, and thin out the plants to a foot apart, preserving only those which appear the finest and true to the variety. Give protection from frost in winter, and secure their stems in the following season from breaking by the wind. Instead of sowing to raise plants for bearing seeds, a few roots of the finest of the main crop may be taken up and replanted in spring. Seed should never be saved from any plants which run to flower in the year of sowing.

Forcing.—Beet-root will not bear hard forcing, but, if wanted in April or early in May, the attempt should be made to forward some under glass. The Egyptian or Turnip-rooted (fig. 1160) is the best for this purpose. Sow the seeds thinly in pans or boxes late in January, and place in gentle heat to germinate. Before the plants become drawn and weakly, set them on a shelf near the glass in a temperature of about 60° by day and 50° by night. By the time two or three lights are cleared of forced Potatoes, these, without much further preparation, could be utilized for Beet. Failing these, form a very mild solid hot-bed, and cover with 6 inches of fresh loamy soil. Make the soil quite firm, a loose root-run promoting the growth of leaves rather than of roots. Prick out the plants when 4 inches high, 6 inches apart, in rows 12 inches or rather less apart. Water with tepid water to fix them, and see that they are never dry at the roots afterwards. Keep them rather close for a time, and mat over the lights every night. When well established, ventilate rather freely, and on mild sunny days remove the lights for a few hours. In this way some very tender roots will be fit to draw for use when about 2 inches in diameter. Beet may also be forwarded considerably in rough frames, with or without bottom-heat, and a few short rows might be planted out on a sunny border, with every likelihood of their doing good service.

II. **LEAF-BEET** (*Beta Cicla*) is a hardy biennial, a native of the sea-coasts of Spain and Portugal. It is cultivated for the leaves and leaf-stalks, but chiefly for the latter; for, as regards the roots, they are hard, much divided, and unfit for cooking. The thin part of the leaves is sometimes put into soups, together with sorrel, the acidity of which it corrects; the stalks and midribs, when peeled, are usually boiled and served up in the same way as Asparagus or Sea-kale, and they are sometimes stewed with sauce. The varieties are: *Green* or *Spinach-leaved* (fig.

1157), *White* or *Silver*, *Yellow-stalked*, *Red-stalked*, *Curled*.

Of these the first-named is the most serviceable; the Red-stalked and Yellow-stalked are very beautiful, owing to their bright colours.

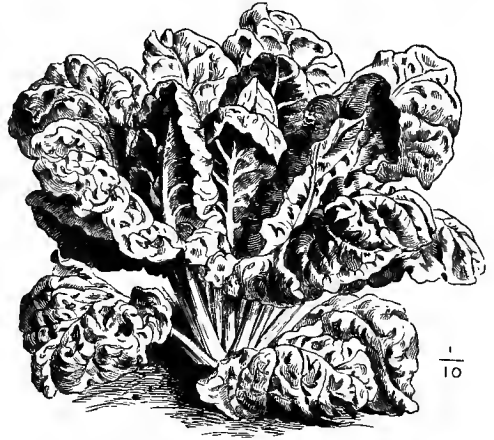


Fig. 1157.—Leaf-Beet—Green or Spinach-leaved.

The leaves of the fifth sort are curled like those of a Savoy, and have broad white midribs.

Any good garden soil will suit the Leaf-beet. The seed should be steeped and sown in drills 18 inches apart and 1½ inch deep; in March for autumn and winter use, and again in August for a spring supply. When the plants are a few inches high, so that those likely to make the best growth can be distinguished, they should be thinned out to 9 inches or a foot apart, according to the richness of the soil, more room being allowed in rich ground. Some, however, should be left to fill any vacancies that may occur. The ground should be kept clean, and occasionally stirred between the rows, taking care not to injure the roots. In dry weather plenty of water should be given to promote the succulence of the leaves. When sown in autumn, the plants should be protected with litter during very severe weather. The outside leaves should be the first cut for use; the others will come in for succession. At their best they are but a poor substitute for Winter Spinach.

Insects, &c.—See chapter on this subject.

Leaf Enemies.—Beet Carrion Beetle, Beet Fly, Silver Y-Moth, Turnip Fly. *Root Enemies.*—Daddy Long-legs, Dart Moths, Pot Herb Moth. The principal garden varieties are:—

Cheltenham Green-Top.—Leaves green, roots 6 inches in circumference, with a conical crown; flesh bright-red, of excellent flavour.

Dell's Crimson (fig. 1158).—Leaves rich dark glossy-crimson, of uniform medium height, compact and slightly

arched; roots 9 inches in circumference; flesh purple; a first-rate table kind, being of excellent quality when cooked.

Nutting's Dwarf Red.—Leaves 12 inches high, dark blood-red; roots 9 inches in circumference, with a conical crown; flesh purplish, sweet when cooked, the flavour excellent.

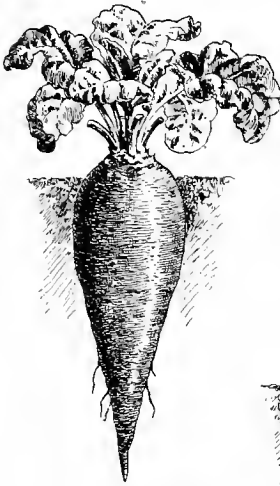


Fig. 1158.—Beet—Dell's Crimson.

broad flattish crown; flesh crimson, when cooked sweet, mild, tender, and free from earthiness.

Red Castelnauary (fig. 1159).—Much esteemed for its superior nut-like flavour. Leaves green, with purple veins, thickly clustered, spreading, foot-stalks purple, not exceeding 3 inches; root 2 inches in diameter, tapering, 9 inches long; flesh deep-purple, very tender and sweet, preserving its colour when boiled. May be grown closer than the others, as it occupies much less space in the ground.

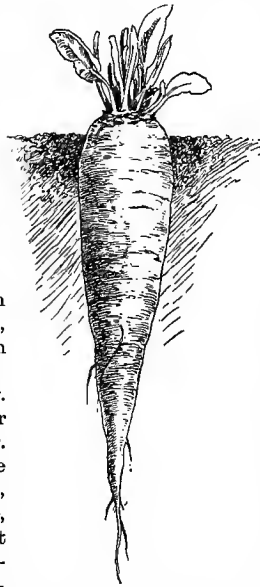


Fig. 1159.—Beet—Red Castelnauary.

Short's Pine-apple.—Leaves 7 inches high, dark-purple, the stalks tinged with dull-orange; roots 6 to 8 inches in circumference, the surface bluntly furrowed, the crown conical; flesh deep-crimson, tender when cooked, sugary, and well-flavoured. Is remarkable for its dwarf compact habit.

Turnip-rooted Red (fig. 1160).—Leaves few, the foot-stalks 5 or 6 inches long, pale, tinged with purple; root purplish-red, with irregular rings of a lighter colour, pink when boiled; though coarse in appearance, it is tender and free from fibres, and early in the season is excellent.

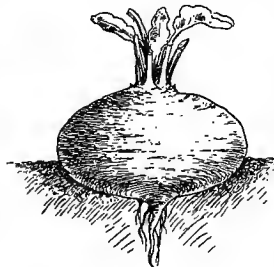


Fig. 1160.—Beet—Turnip-rooted Red.

White Silesian.—Root very large, a little elongated; skin greenish-white; flesh white. This variety is largely grown for the extraction of sugar, of which it contains from 5 to 12 per cent.

—The Borecoles constitute one of the hardiest divisions of the Cabbage tribe, and on this account they are useful in northern climates for the supply of winter greens. They thrive in any garden soil if provided with plenty of manure. For a north border the Dwarf Curled is the most suitable. The main crop should be sown in the first week of April, or, in the northern parts of the kingdom, in the third week of March; and for a succession again in the first week of May. A sowing of the Buda Kale for late spring use should be made in the last week of August, in rows 2 feet apart, where the plants are to grow, thinning to a distance of 6 inches apart, or transplanting in September. The Tree, Thousand-headed, and Flanders should be sown early in spring, or, preferably, in the north in the first week in August.

The plants should not be allowed to get overcrowded in the seed-bed, which should be relieved by pricking out a portion in some spare corner where they will enjoy light and air. By these means a healthy stock, capable of producing more succulent greens than could be expected from a plantation formed of lingering ill-conditioned plants, will be ensured. The distance of planting will depend on the variety and on the nature of the soil, the large growing sorts, of course, requiring more space than the smaller ones, and the whole of the sorts more in rich soil than in that which is comparatively poor. In general, however, they may be planted in rows 2 to 2½ feet apart, and 18 inches from plant to plant in the rows. Tree and Thousand-headed require to be planted 2 or 3 feet apart each way. The subsequent culture consists in watering till the plants strike root if the weather proves dry, hoeing and stirring the soil between the rows, and as the tall sorts advance in growth, earthing up the stems. Caterpillars should be shaken or picked off and destroyed.

In gathering, the heads of the Dwarf and Tall Borecoles should be cut first; the stem will then push fresh lateral sprouts.

To save Seed.—This is an easy matter; but to save the varieties true to the kind is frequently difficult, notwithstanding the greatest care, the different varieties of the Brassica tribe being so liable to cross in consequence of the pollen being carried from one variety to another by bees, flies, or other insects, or even by the wind. It is therefore not sufficient to net the seed-plants, so that bees cannot reach the flowers; it is even questionable whether the reverse of what is intended is not occasioned by so doing, for the bees in hovering above the netting will lose

Borecole, or Kale (*Brassica oleracea acephala*).

some of the pollen brought on their hairs from flowers of other plants of the Cabbage tribe, and that falling amongst the plants frequently effects a cross. By selecting plants of the best characters, and planting a dozen or so together, we have known a very fine Dwarf Curled Borecole saved perfectly true for many years. The plants for seed should be taken up early in spring, and planted rather deeply in a spot well exposed to the sun, and rather sandy than stiff. They should be watered moderately so as to keep them in a healthy state, and the stems should be supported to prevent breakage by the wind. When the seeds are ripe they should be rubbed out, cleaned, dried, and stored in a dry place.

Insects, &c.—See under Cabbage.

Asparagus Kale (Manchester Kale, Camberwell Kale).—Stem 18 inches to 2 feet high, producing numerous side shoots in spring, which may be blanched like Sea Kale, and are tender and of good quality. Leaves purplish, somewhat glaucous, smooth, bluntly-toothed. A very hardy and valuable late variety.

Chou de Milan.—Stem 2 feet high; leaves bluish-green, rugose, forming an open crown. In February and March a number of open sprouts are thrown out along the stem, and these when cooked are of rich and delicate flavour. Closely allied to the Cottagers' Kale.

Cottagers' Kale.—Stem about 2 feet high; leaves plain or curled, some green, others purplish-green. The plants throw out an abundance of shoots in spring, and furnish a large supply of greens. One of the hardiest and most useful for general supply.

Dwarf Green Curled (Green Scotch Kale) (fig. 1161).—Very hardy, dwarf, liable to be completely covered with

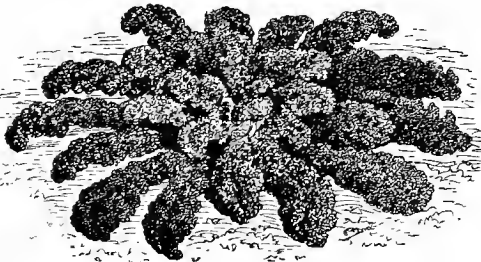


Fig. 1161.—Borecole—Dwarf Green Curled.

snow, and thus protected when the taller kinds are either completely destroyed by frost, or rendered so tough as to be unfit for use.

Dwarf Purple Borecole.—Merely a form of the Tall Purple, distinguished by its dwarf habit.

Egyptian Kale.—Stem 6 inches in height; produces numerous succulent shoots a foot or more long in spring, which may be blanched and used as a substitute for Sea Kale and Asparagus. A very hardy and excellent sort.

Flanders Kale is a tall-growing kind, distinguished from the Tree Cabbage by its purplish foliage.

Imperial Hearting or Cabbaging Kale.—Resembles the Dwarf Green Curled in the nature, colour, and general appearance of the leaves; the heart-leaves, however, fold over each other, somewhat like those of a Cabbage. The quality is excellent.

Jerusalem Kale.—Resembles Egyptian, but has the margins of the leaves curled instead of plaited, as well as tinged with purple, when young. It may be blanched and used like Egyptian Kale.

Purple Borecole (Purple Winter Greens).—Differs from Tall Green Curled only in colour, which is deep-purple; as the leaves enlarge they become greener. Very productive and hardy; much grown by the Germans, who dress it with a rich sauce, and sometimes mix Chestnuts with it, stewing them together.

Ragged Jack.—Dwarf, resembling Egyptian in habit; the leaves glaucous, deeply cut, often curled, not hairy when young. Of good quality, extremely hardy, and very productive.

Tall Green Curled (Tall Scotch Kale) (fig. 1162).—Height from 2 to 3 feet; capable of enduring a consider-



Fig. 1162.—Tall Scotch Kale.

able degree of frost, and, like the preceding, affording the best greens from the time the first frost has mellowed its flavour to the middle of February. The quality is improved by frost, but impaired by dry frosty winds.

Thousand-headed Cabbage is allied to the Tree Cabbage, but does not grow so tall, and on the whole is preferable to it.

Tree Cabbage (Great Cow Cabbage, Jersey Kale) (fig. 1163).—This grows to the height of 6 feet, and in La Vendée and Jersey it is said to attain the height of 12 feet. The leaves are large, smooth, or but slightly curled; its sprouts are said to be good when cooked.

Variegated Borecole (Variegated Plumage Kale).—A tender form of the Purple Borecole, having the leaves beautifully variegated; sometimes green and yellowish-white, green and purple, bright-red, purple, or green. It is occasionally employed for garnishing; but it is very good cooked after frost. *Melville's Variegated Kale* is another form, variously curled and fringed with green, red, or purple.

Woburn Perennial Kale.—A tall form of Purple Borecole, with foliage very finely divided or fringed. The plant

lasts many years, and may be propagated by cuttings, as it neither flowers readily nor perfects seeds.

walls, and be composed of rich light earth. Fresh maiden loam, well mixed with the soil of the beds, is beneficial. If dry, the soil should be watered the day before sowing. If the seeds have proved to be good, they should be thinly sown, and preferably in shallow drills drawn about 6 inches apart, covering with quite fine soil. It may be advisable to cover the beds with mats, but these must be removed immediately the seedlings appear. When the plants are strong enough they should be thinned, and the ground stirred with an inch hoe. When about 3 inches high they may be transplanted, 4 inches apart, in nursery beds. Early sorts should be transplanted when very young, and with care, so as not to check them and start them prematurely into flower. They are easily and safely removed by loosening the soil with a fork when it is moist. They should be examined, to see that they each have a central bud or growing point. Blind plants should be rejected, and likewise any with small knobs on the roots that would probably lead to clubbing.



Fig. 1163.—Tree Cabbage or Jersey Kale.

Broccoli (*Brassica oleracea* var. *Botrytis*).—A cultivated variety of the wild Cabbage. It is not so hardy as many others of the *Brassica* family, in this respect resembling the Cauliflower. The difference between some of the varieties of Broccoli and the Cauliflower is scarcely perceptible. Philip Miller, in his *Gardener's Dictionary*, suggests that the Broccoli known in his time was derived from the Cauliflower, which he states was imported from the island of Cyprus.

Sowing the Seeds.—Near London seeds of the early kinds are sown about the 10th of May, and the late kinds in the second or third week of April. Nothing is gained by early sowing, and often much is lost, owing to the plants having to stand too long in the seed-bed. Leggy plants are among the first to succumb to frosts, this being another objection to early sowing. The spring kinds should be sown in the middle or end of April. The seed-beds should be located well in the open—not at the foot of garden



Fig. 1164.—Broccoli—Sutton's Bouquet.

Broccoli succeeds best in a good loamy soil. In such it may not grow so large as in that which is very rich and highly manured; but

the quality is finer, and the plants are not so liable to be attacked by club as in richly manured soil. Where this disease is prevalent the ground should be dressed with quicklime. For autumn sorts the ground may be highly manured; but if made too rich for winter and spring sorts, the plants will be more liable to injury by frost than those less stimulated. It has been ascertained that in severe winters Broccoli growing in the open field have been nearly all saved; whilst those of the same sort planted in well-sheltered gardens have been nearly all killed.

With regard to manure, farmyard manure is probably the best; but in some cases other substances may be applied with advantage. In gardens that have been long cropped with vegetables, marl will be an excellent application for this crop. Lime may also be mixed with the soil in digging, or applied occasionally, and when newly slaked, to the surface of the ground; but not after the heads begin to form. Flowers of sulphur dusted on the roots when transplanting will tend to prevent mildew; common salt and nitrate of soda may be used with advantage in killing worms or grubs which attack the stem and roots. Guano is a powerful stimulant, but it produces a rank growth; and though the produce may be large, the quality is not so fine as that obtained where marl is applied.

Loose, rich ground promotes leggy, sappy growth; a firm or almost solid root-run is therefore preferable, as this tends to keep the plants sturdy and hard. The start should be made with young plants direct from the seed-bed, firmly fixed with the dibber, and not crowded. In some districts the hardiest, if not the finest, Broccoli are grown on land just previously cleared of either early Peas or Strawberries, both crops usually leaving the ground in a solid state. The surface is merely hoed over and all rubbish removed. Drills are then drawn with a heavy hoe, and, if dry, given a good soaking with water or liquid manure, soon after which planting may be done with a dibber. Some gardeners make the holes with a crowbar, and are rewarded with a supply of Broccoli even after severe frosts. Broccoli required to stand through a winter should have plenty of room—3 feet apart each way if on comparatively loose ground, $2\frac{1}{2}$ feet apart if on solid ground. Veitch's Autumn Protecting, and others which heart early, may have $2\frac{1}{2}$ feet each way, while the smaller forms, such as the White Cape and the Walcheren, may be planted 18 inches from plant to plant in rows 2 feet apart.

Occasional waterings may be required in dry weather. The surface of the ground should be kept stirred, and some earth drawn to the stems. When the heads of white Broccoli are exposed to light, and especially to the direct solar rays, their colour becomes dingy or yellowish; to prevent this the side leaves should be broken over the heart to afford shade.

Protection in Winter.—Although most of the varieties of Broccoli are hardy enough to resist a few degrees of frost, some even withstanding severe frosts, yet we occasionally experience winters that cut off nearly every kind, especially if they have not been grown as hardy as possible. This loss can be prevented by taking up, on the approach of frost on a dry day, those which have either formed or are just beginning to form a head, and placing them side by side on the floor of a cellar. Or lift them with some soil about their roots and replant them firmly and somewhat closely in rich moist soil, where they can be readily protected with mats and litter. Empty pits in vineries at rest, Peach-houses, and such like, as well as ordinary brick pits and deep wooden frames, are suitable for this purpose, and if the plants are moved before severe frost cripples them there will be a good supply of small hearts till midwinter or later.

Taking the Crop.—Broccoli, for some tables, is required to be cut when not larger than a tea-cup; for others it is allowed to be full-grown; but in no case should it be allowed to remain till the compactness of the head is broken. It should always be cut whilst the curd, as the flowering mass is termed, is entire, or before bristling leafy points make their appearance through it. In trimming the head a portion of the stalk is left, and a few of the leaves immediately surrounding the head, their extremities being cut off a little below the top of the latter.

To save Seed.—Select those plants that in leaf and flower are most characteristic of the variety. Some allow them to remain where they have grown; others prefer transplanting them carefully, supplying them regularly with water during the summer. Those plants which have a disposition to produce large and coarse leaves should be avoided. For early sorts, the smallest plants with the least undulated leaves may be selected and planted out late in the season, and afterwards removed and replanted in fresh soil, in order to retard their flowering till next spring.

Insects, &c.—See under Cabbage.

Cattell's Eclipse.—A sturdy dwarf sort, with short broad leaves, the inner ones forming a good protection to the compact white head. One of the latest and best.

Chappell's Large Cream-coloured.—A very large sort, which comes in earlier than the Portsmouth, and continues to produce throughout the winter. Sow about the middle of April and first week in May.

Daneer's Late Pink Cape.—A very fine late Broccoli. Heads large, with a close surface. In use in March.

Danish or Late Green.—Leaves long, narrow, much undulated. Heads tolerably large, compact, exposed, and of a greenish colour; fit for use in April and May. The hardest and best for withstanding severe winters. Sow in the second week in May.

Grange's Early White (Bath White) (fig. 1165).—One of the earliest of the white kinds, forming a succession to the

with very large white heads, is supplied to the Edinburgh and Glasgow markets up to June. Self-protecting and very hardy.

Leamington.—One of the best of the late sorts, and being well protected by its leaves it winters well. It is largely grown for market. Sow late in April.

Mitchinson's Penzance (Early White Cornish).—Leaves much undulated on the margin; heads large, compact, pure white. Is extensively grown in Cornwall for the London markets, and comes into use in April. Too tender for general cultivation.

Model.—Dwarf, compact and hardy, with medium close conical head well protected by the leaves. Sow late in April for use in the following April and May.

Portsmouth.—Leaves large, broad, with white veins; heads large, of a buff or cream colour. It is fit for use in March and April. Requires to be sown in the first or second week in May.

Purple Cape (fig. 1166).—Height 1 foot to 18 inches. Leaves nearly entire, waved; veins and midrib stained with purple. Heads middle-sized, compact, purplish-green, the whole becoming green when boiled. Sow first and third week in May, for use in September and October. A longer succession—namely, till January—may be obtained, if required, from a sowing in the second week in June.

Snow's White Winter.—Dwarf habit; leaves broad, with short petioles. Heads large, very compact, well protected with leaves, white, and equal in quality to those of the Cauliflower. Sown first week in May and middle of June, the produce will be fit for use in December, January, and March.

Sprouting (Asparagus Broccoli) (fig. 1167).—A strong-growing hardy sort, from 2 to 3 feet high; leaves spreading, much indented, of a purplish-green; head deep-purple; smaller sprouts from the axils of the upper leaves. If sown in April it produces heads or sprouts fit for use in November. After the first head is cut out a succession of sprouts is produced through the winter. The principal sowing is, however, made in the first or second week of May;



Fig. 1165.—Broccoli—Grange's Early White.

late crop of Cauliflowers. Sown in the first and third weeks of May, beautiful heads are produced in October, November, and December.

Green Cape.—Leaves long, narrow, veins and midribs green. Head greenish, generally covered by the leaves; comes into use in October and November, from sowings in the middle of May, and in December if sown in the second week in June.

Green Close-headed.—Dwarf and hardy, leaves large, waved, veins white. Heads middle-sized, exposed, of a greenish colour. Sown in the third week of May, it produces a succession of compact heads from November till the end of February.

Knight's Protecting (Frogmore Protecting).—One of the hardest of the white sorts, excellent when true, but is apt to degenerate. The leaf-stalks are twisted, so as to encompass and protect the head, which is very large and white. Sow in the third week in April and second week in May. This is the parent of many late white varieties, having the protecting character of twisted leaf-stalks.

Late Dwarf Purple.—Very dwarf and hardy. Leaves short, dark-green, deeply indented. Heads small, conical, deep-purple, becoming fit for use in May. Sow in the third week in May.

Latest of All.—Very hardy, late and reliable, usually at its best in May. Its leaves afford protection to both stem and head, the latter being large, compact, and of good quality. Sow late in April or early in May.

Lauder's Goshen Late White.—An excellent late sort,

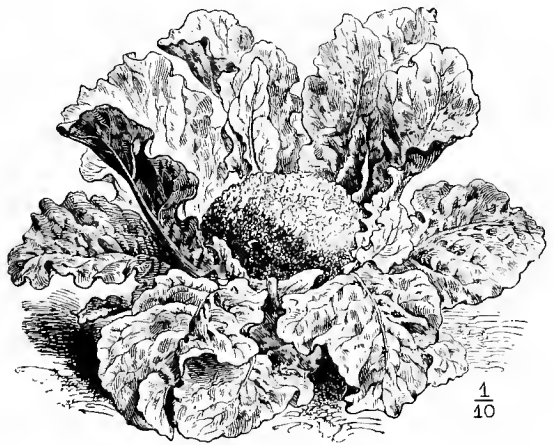


Fig. 1166.—Broccoli—Purple Cape.

but if the ground intended to be planted is not likely to be cleared of the previous crop in time to receive the Broccoli plants sown in the beginning of May, before

they get too old in the bed, the sowing must be deferred till the end of May or beginning of June; and from these late sowings, heads or sprouts will come in for use in April.

Sutton's Bouquet (fig. 1164).—The central head is surrounded by several smaller heads, varying from five to twelve in number. A very late Broccoli, perfectly hardy, having escaped injury during most inclement winters.



Fig. 1167.—Sprouting (*Asparagus Broccoli*).

Sutton's Late Queen.—Quite distinct, dwarf and compact in growth, rarely affected by frost, and produces splendid heads in May and June. Has resisted the intense cold of the most severe winters. The heads are well protected, large, handsome, and excellent in quality.

Veitch's Autumn Protecting.—A valuable early variety, and one which should be largely grown. It produces firm close compact white heads, of delicious flavour. The protective covering of leaves is very strongly developed. Sow under glass in March and in the open ground in April.

Walcaren. See *Cauliflower*.

Ward's Superb Late White.—Very much resembles Knight's Protecting, but it comes in for use about three weeks later. Doubtless originated from it, like many others of the better late white sorts. One of the finest late varieties.

Willcove.—Late, dwarf, and comparatively hardy, affording a supply till Cauliflowers come in. It derives its name from a small village near Devonport, noted for the production of late Broccoli, and where this variety is grown in great perfection.

Brussels Sprouts (*Brassica oleracea gemmifera*).—Although buds or their rudiments are formed in the axils of all the leaves of the Cabbage tribe, yet in many cases they do not push, especially in the first year of their growth. In the second year after sowing it will be observed that the stems of the common Borecole become covered with open leafy sprouts; but in the first season buds push all along the stems of Brussels Sprouts from every point whence a leaf had proceeded. These buds,

like little Cabbages, about the size of a Walnut, are arranged spirally on the stem, often completely covering it. Most of the original side-leaves drop off as the buds enlarge. The stem sometimes attains the height of 4 feet; but dwarf stems produce Sprouts more tender and succulent when cooked than those obtained from very tall stems.

This vegetable has long been cultivated near Brussels, the place from which it derives its name. Dr. Van Mons, of Louvain, says: "We have no information as to the origin of this vegetable; but it has been a very old inhabitant of our gardens, for it is mentioned in the year 1213 in our regulations for holding the market, under the name of *spruyten* (sprouts), which it bears to this day". Having been long grown true at Brussels, whilst elsewhere it usually degenerated, it was supposed that genuine seeds could only be obtained from Brussels; now, however, the best strains are of British origin.

This vegetable was supposed to be too tender for our winters. It proves, however, to be more hardy than the Savoy, or almost as hardy as the Borecole, and it is possessed of much greater excellence than either. When well-grown, the amount of its edible produce is more than equal to that of the Borecole. Brussels Sprouts are now extensively grown in the gardens of all classes for the supply of a first-rate vegetable in winter.

Brussels Sprouts will grow in any garden or field soil. Mr. Judd, who was among the first to effect an improvement in them, and who grew his plants remarkably well, states, that one part of his garden was rather light and sandy, upon a substratum of old red sandstone; that another part was a stiff heavy soil, upon a substratum of blue clay; but that this vegetable grew equally well on both.

In poor soils manure may be given; but its application in large quantities is not in any case advisable, for it stimulates the plants into great luxuriance, and thus tends to make them produce large loose sprouts.

Sowing.—For the principal winter crop sow about the middle of March, and first or second week in April; and for a succession for late spring use, a small sowing should be made in the first or second week in May. For an early crop sow, as they do at Brussels, in slight bottom-heat in February, and plant out in a warm situation in April. In Scotland, and in cold situations in England, sow in August, and transplant the seedlings in spring; for succes-

sion sow again in March, and a small sowing again in April. From late-sown plants less produce is obtained than from those sown early, but the quality is better.

Planting.—The Aigburth, Exhibition, Ne Plus Ultra, Matchless, and Perfection are considerably stronger growing than the old imported, and therefore require more room. Those who wish to economize space may plant short-hauled

early Potatoes such as Ashleaf on the ground intended for Brussels Sprouts. Dispose the rows of the former 3 feet apart, and after they have received a final moulding up, plant Brussels Sprouts in the furrows between them at a distance of $2\frac{1}{2}$ feet apart. Lift the Potatoes early, and bank the soil from the ridges against the stems of the plants, this steadying and otherwise benefiting the latter. It will be



Fig. 1168.—Brussels Sprouts—Market Favourite.

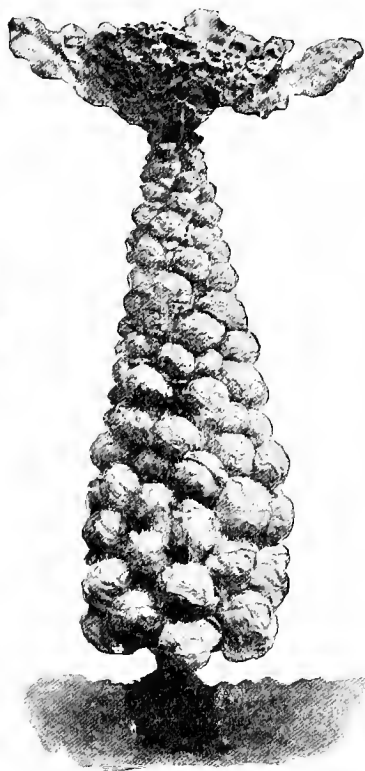


Fig. 1169.—Brussels Sprouts—Sutton's Matchless.

found that not an inch too much space has been allowed, the Brussels Sprouts eventually covering the whole of the ground, so that the crop of Potatoes is a clear gain. If planted early on good or strong ground reserved solely for them the same distances should be allowed, crowding proving inimical to the production of close Sprouts in quantity, those great loose things too often seen being usually the outcome of planting too thickly. If planted out later than May less room will be required, and also if the ground is poor. Paragon and Paris Market are not so tall growing, and these, therefore, may be planted 18 inches apart in rows 2 feet asunder.

The plants should be kept moist till established, drawing a ridge of soil up to the stems

after the necessity for further watering is past. If they are likely to suffer for want of moisture at the roots during a dry hot summer, draw soil well up to the stems and pour water very freely along the furrows. When the side-leaves are fading and beginning to fall, remove them, but on no account interfere with the tops. These, when fully grown, form a very tender mildly-flavoured dish, but should yet be left where they are till late in the season, as they serve to nurse up and protect numerous close late Sprouts—the latter always meeting with favour. Also cut the Sprouts so as to leave a short stump behind, rather than drag them off with a portion of the bark of the stem with them, as by the former method only is a good supply of small Sprouts ensured. These are particularly

acceptable after a hard winter. When they are wanted as late as possible lift the plants early in the spring, and replant rather more closely than formerly on a north border or other cool place, this retarding growth considerably. The tops should be removed whether wanted for use or not. Seeds to be saved from the best stocks only, and in the same careful manner as advised in the case of Borecole.

Insects, &c.—See under Cabbage.

Albert.—This was raised by Mr. Melville at Dalmeny Park, near Edinburgh, and is the result of a cross between the Drumhead Savoy and Brussels Sprouts. It is hardy and late in running to seed.

Dalmeny.—This was also obtained by the same raiser as the preceding, by crossing a dwarf Cabbage with Brussels Sprouts. Its stem is 6 or 8 inches high, with a compactly cabbaged head of moderate size, and thickly set with Cabbage-like sprouts. Both of these should be planted 2 feet by 1½ foot apart.

Dwarf Gem.—The dwarfiest of all Brussels Sprouts, producing buttons in advance of other varieties. Of medium size, very solid, and delicious in flavour.

Exhibition.—A distinct and early variety; of vigorous growth, perfectly hardy, and very productive, the stems being covered from top to bottom with sprouts, which are firm, solid, remarkably tender, and of delicate flavour; remaining a long time fit for use.

Market Favourite (fig. 1168).—A selection from one of the best strains sent to Covent Garden Market. Is of medium growth, and produces an abundance of firm, tender sprouts of good size, which remain a long time fit for use.

Paragon.—A very superior strain of dwarf growth and compact habit; bearing in abundance closely set, medium-sized solid sprouts, of fine quality and mellow flavour.

Paris Market.—A dwarf early strain, producing small, very solid sprouts of excellent quality.

Scripmer's Giant.—A first-class sort, dwarf, with large firm sprouts, which remain a long time fit for use; very reliable.

Sutton's Matchless (fig. 1169).—Growth robust, stems covered with compact globular sprouts of excellent flavour. Very hardy, taller than Exhibition.

The Aigburth.—Very large sprouts, hardy and productive.

Cabbage (*Brassica oleracea*).—The Wild Cabbage, from which all the garden races of Cabbage have sprung, is a native of sea-cliffs on the south-west of England and Wales and the Channel Islands. It is also wild on the west and south coasts of Europe. In its wild form it is a biennial or perennial, with a stem 1 to 2 feet high, stout, tortuous, usually decumbent and scarred, leafy at the top, the leaves wavy, glaucous, and succulent, 1 to 1½ foot long; flowering raceme elongate, bearing pale-yellow flowers an inch in diameter.

De Candolle states that the date of its cultivation is probably very ancient, earlier than the

Aryan invasions, and that no doubt the wild plant was gathered before it was cultivated.

"The principal kinds of Cabbage existed at least as early as the sixteenth century, so that numerous modifications of structure have been inherited for a long period. This fact is the more remarkable, as great care must be taken to prevent the crossing of the different kinds. I raised 233 seedlings from Cabbages of different kinds, which had purposely been planted near each other, and of the seedlings no less than 155 were plainly deteriorated and mongrelized; nor were the remaining 78 all perfectly true. It may be doubted whether many permanent varieties have been formed by intentional or accidental crosses, for such crossed plants are found to be very inconstant." (Darwin.)

Soil.—A rich, well-manured soil is essential for the production of tender and succulent Cabbages. Near London they are grown in perfection, usually in ground that has become light by the application of enormous quantities of dung during a long period of years. The ground, however, is trenched, or undergoes double digging; for, in ground so managed, the plants are not so liable to club-root as they are in ground that is merely dug over. They will grow on soil that is too adhesive for Turnips, but the manure applied to such a soil should be of an opening nature, and all the better if not much decomposed. Farmyard manure in a fresh state will be most proper in this case, and it should be buried to the depth of one spit below the surface. They also grow well on peat soil; but to such, a dressing of lime, marl, gypsum, or even burnt clay, will be advantageous. Guano, superphosphate of lime, nitrate of soda, lime rubbish, wood-ashes, and marl have been applied with advantage; and other artificial manures may be given occasionally; yet they have not the mechanical advantages possessed by farmyard manure, which, by keeping the soil open, acts as a kind of drainage.

Sowings.—The first sowing should be made about the end of February or beginning of March. It should chiefly consist of Ellam's Early or other quick-growing varieties of medium size and good quality. From this sowing a supply will be obtained for use in July and August, and will thus form a succession to the autumn-sown crops.

A second sowing, which may be the principal spring one, should be made in the last week of March or first week in April, to come in for use from August till November.

A third sowing, to consist chiefly of either

Nonpareil, Shilling's Queen, or Little Pixie, with London Rosette, or similar kinds that heart quickly, may be made in May for the early part of winter.

The fourth, or autumn sowing as it is occasionally termed, is the most important, as it



Fig. 1170.—Cabbage—Ellam's Early.

furnishes the plants which afford the principal supply for spring and early summer use. The proper time for this sowing varies from the middle of July to the middle of August, according to the soil, climate, and variety employed; a cold soil and climate requiring the

earlier period, whilst the later period is the most suitable where the contrary is the case. Early Battersea, Early Offenham, Sutton's Earliest, Ellam's Early, and allied sorts, not being apt to run to seed, may be sown earlier than Early York, and others similar to it, which often start into flower without previously forming a heart.

In warm soils and situations the best time for sowing such kinds as Early Offenham and other "non-bolters" is the end of July, a week earlier answering well in the south-western counties, even if the subsoil is of a clayey nature. Many of the market-gardeners near London always sow at this time, or as soon afterwards as possible. In cold situations, especially in Scotland, the seeds of early varieties should be sown from the 10th to the 15th of July. Early York, and others of a similar nature, ought not to be sown till the second week of August in the north, and not till the end of that month in the warm parts of the south. Those sown in July will be ready to plant out early in September; and those sown in August early in October, as soon as ground can be cleared for their reception.

Red Cabbages should be sown in the end of July and in March; and a few of some small sort may be sown in a frame in the end of January or beginning of February, as they may be wanted

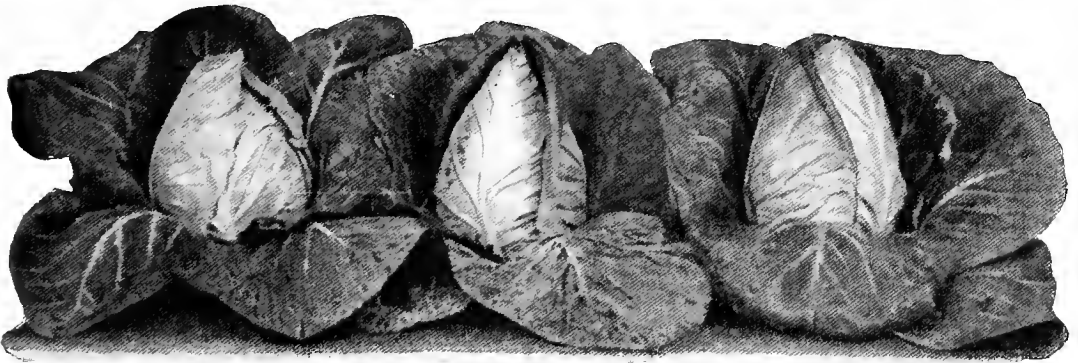


Fig. 1171.—Cabbage—Sutton's Earliest.

for pickling before those sown in March are fit.

Sowing for Coleworts.—The cultivation of an open, hardy Dorsetshire Kale, for winter Greens, has long been discontinued. These Greens were known under the name of Coleworts. This name, or others evidently derived from it, as Collard and Collet, is now applied to young unhearted Cabbages, which are pulled up by the roots, and tied in bunches for the market. Improved

Nonpareil, and allied sorts answer well for this purpose. The seeds are sown for Coleworts about the third week in June. Matchless, being more apt to run to seed, may be sown with the same object about the middle of July, and successional plantations, for filling up spare ground, may be made from the principal autumn sowing of Cabbages in July.

Additional Sowings.—Sowings at the periods named will generally be sufficient for a supply

throughout the year; but in case of any deficiency in the autumn-sown crop, it will be advisable to sow some of the early kinds, and also a few small red Cabbages, on a warm border, about the end of January or beginning of February; or, preferably, in a frame, taking care, however, that the plants are kept thin, exposed as much as possible to the light, plenty of air being given at all times, and covering only when the severity of the weather renders it absolutely necessary.

Cultivation.—The soil in the seed-beds should be light and well pulverized. On a large scale, the ground is raked tolerably smooth, the seeds sown broadcast or in drills, raked in, and rolled. In private gardens, where fewer plants are needed, the seeds can be sown in drills or broadcast on a bed in any convenient position, passing a light roller over the bed, or beating it lightly with the back of the spade. If the weather is very hot and dry, cover the bed with a mat, in order to keep the surface moist till the plants make their appearance. When large enough they should be regularly thinned, and the soil kept stirred with a small hoe. Thus treated the plants do not become crowded, and they form good roots without pricking out into nursery beds, as is sometimes done in order to encourage the production of more fibres. This object may also be effected by thoroughly watering the beds about a week before transplanting, and then raising a little both soil and plants with a fork. In consequence of this moving, fresh roots are emitted, and the plants suffer less when finally transplanted.

The distances at which different sorts require to be planted depend on the size which they usually attain and on the richness of the soil. The smallest sorts may be planted a foot apart each way; but a somewhat greater distance may be allowed in very rich soil. Near London, the early varieties are planted for spring Cabbages at 2 feet apart each way; but then the rows are backed, as it is termed, with plants sown a week or ten days earlier. A plant is inserted between every two in the rows already planted, to be afterwards drawn as Coleworts; and, for the same purpose, an intermediate row is planted a foot apart between the permanent rows. The ground is then occupied with plants at a foot apart each way, but all are removed for use as Coleworts in the course of the winter, except those planted at 2 feet apart for hearting in spring. If Coleworts are not to be grown intermediately, the distance between the plants is reduced to 22 inches each way.

Coleworts, when planted by themselves, may be about 8 inches apart, in rows a foot asunder, and every alternate plant in the row should be taken as required for use; the additional space thus given will soon be occupied by the plants which are left.

In planting out Cabbages, advantage should be taken, if possible, of cloudy moist weather; but in long-continued drought the plants in the seed-beds may get so large as to render it absolutely necessary to plant them out at all hazards. The surface of the ground for the intended plantation should be well pulverized, and drills similar to those made for Peas should be drawn for the rows, and well watered a day previous to planting. If there are dry clods and dust on the surface, the consequence is this—when the dibber is thrust in and withdrawn, a portion of the dry clods and dust falls into the hole—a condition very unfavourable for the roots. The seed-beds should also be well soaked, in order that the plants may be moved with little injury to the roots, which should be raised with a fork, and exposed to the air as little as possible.

The drills in which the Cabbages have been planted should be kept only moist, and not what would be termed wet, till the plants have struck root, when, if the surface of the ground be kept stirred, watering will scarcely be required. Except in dry weather, furrows or drills for the plants are not required. Grounds which supply the best Cabbages for the London markets are planted on the level, and no mould is drawn to the stems, which, in fact, do not require it; for the best growers do not cultivate what are termed long-legged sorts, neither do they force their plants to become such by bad treatment, such as overcrowding in the seed-bed. These cultivators find it advantageous to stir the whole surface of the soil, and close to the roots of the plants. If planted on poor ground, liquid manure should be given freely in the spring, or nitrate of soda at the rate of 2 lbs. to the square rod, otherwise growth will be slow and the hearts of little value. By drawing the soil to the stems furrows will be formed, along which sewage and strong liquid manure generally may be freely distributed with marked benefit to the crops. If the plants are left on the ground to form a second crop, they must be manured afresh.

Propagation by Cuttings.—Cabbages are best raised from seeds; nevertheless they may be advantageously propagated by cuttings in some cases—for instance, in warm climates, where it

is difficult to save seeds; and in this country it might be adopted in order to preserve any particular variety true; for by cuttings we can always depend on perpetuating the identical sort, but by seed this is uncertain. Supposing that it were desirable to preserve some much-prized sort, seed may be saved, and cuttings struck as well. If plants from seeds come true, so much the better; but if they do not, having the plants from cuttings we are still in possession of the true variety, and of the means of again raising seeds from it. The mode of propagating by cuttings is very simple. The sprouts are taken off, and exposed to the air till their juices are so far exhausted as not to exude from the wounded ends, and thus tend to rot the cuttings. It is also advisable to dip the cut end in newly slaked lime, dry wood-ashes, or powdered charcoal. The cuttings may then be planted out, either in the open ground, or, better, in a frame, where they can be properly shaded, not from diffused light, but from the sun's rays, till roots are formed. They may then be fully exposed till fit for planting out.

To save Seeds.—The finest specimens should be selected for this purpose, and the more of them there are, the greater will be the chance of the sort being saved true. The plants may either be allowed to run to seed where they have grown, or they may be taken up early in spring, and planted up to the neck in some place where they can be protected from birds when the seeds are ripening.

Club-root (fig. 1172).—“This destructive disease, also known as ‘Finger-and-Toe’ and ‘Anbury’, attacks the various kinds of Cabbage, Turnip, Radish, Wallflower, in fact most cultivated plants, including weeds, belonging to the order *Cruciferae*. The root is the part most frequently attacked, the presence of the parasite being indicated by the formation of numerous nodules, or wartlike outgrowths, or the entire root becomes swollen and clubbed, eventually rotting and emitting a very disagreeable smell. The disease also exists in the leaves, at least in the case of Cabbages, but no distinction occurs, as in the root.

“The disease is contracted, in the first instance, by spores present in the soil, which enter the living cells of the root of the plant. When once inside a living cell, the parasite does not form a mycelium as in the fungi, but a glairy mass of protoplasm, called a plasmodium, which slowly alters its form from time to time, and constitutes the vegetative condition of the parasite. After remaining in the vegetative state for some

time, and producing the swellings in the root alluded to, the plasmodium undergoes certain changes, and eventually becomes resolved into myriads of exceedingly minute round spores, which, on the decay of the root, are liberated in the soil. What takes place when the spores are set free, as to whether they germinate, form a plasmodium that exists as a saprophite for some

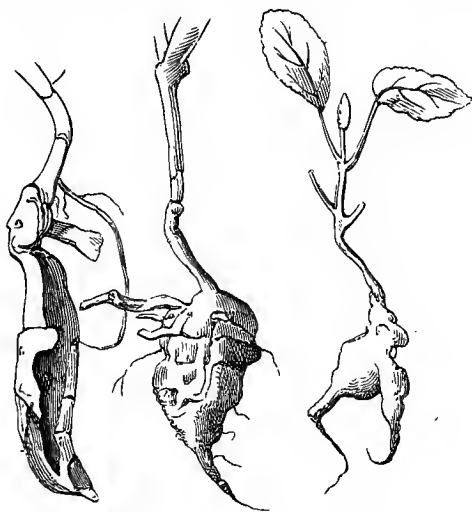


Fig. 1172.—Club-root—Different Forms of Diseased Roots.

time, is not known; but it is known with certainty that if Cabbages, Turnips, or other allied plants are sown or planted in soil that has produced diseased plants the previous season, or even two or three years previously, such plants will become diseased.

“Preventive Means.—From what has been stated, it will be seen that it is simply courting disaster sowing or planting Cabbages, Turnips, &c., in diseased soil; on the other hand, repeated experiments have proved that the application of quicklime destroys the germs in the soil. Lime is an effective preventive of club-root, and by its constant use, at the rate of 75 bushels or so per acre each year, Cabbages have been grown at frequent intervals—almost yearly—upon the same soil! The use of artificial manure containing acids, phosphates, and sulphates, favours the spread of the disease. It has been demonstrated that soil from an infected locality, carried by means of cart-wheels, tools, &c., is sufficient to start the disease in a new locality. Weeds, such as Shepherd’s-purse, Charlock, Garlic-mustard, and other crucifers should not be allowed to grow in places where cultivated plants belonging to the same order are grown. Do not throw diseased plants on the rubbish-heap, but burn them. Dr. Halsted states that

the plants are most susceptible to the disease during the first three weeks after germination, and that 35 bushels of lime per acre is sufficient to arrest the disease." (G. Massee, *Text-book of Plant Diseases*.)

Insects, &c.—See chapter on this subject.

Leaf Enemies.—Blue Cabbage Flea, Cabbage Aphid, Cabbage Butterflies, Cabbage Moth, Cabbage Powdered-wing, Diamond-back Moth, Garden Pebble Moth, Slugs and Snails. *Root Enemies.*—Cabbage Fly, Cabbage Gall Weevil, Daddy Long-legs, Dart Moths, Millipedes, Pot-herb Moth, Wireworms, Yellow Underwing Moth.

SELECTION OF VARIETIES.

All Heart (fig. 1173).—Heads of medium size, conical, compact, with very few outer leaves. An excellent variety for spring, summer, or autumn sowing.



Fig. 1173.—Cabbage—All Heart.

Beaconsfield.—After the style of Ellam's, but later. A dwarf grower with a conical solid head. Seeds sown in August for a late spring crop.

Christmas Drumhead.—Heads large, flat, somewhat spreading. An excellent variety for spring sowing, and for market or large establishments. Not suitable for autumn sowing.

Cocoa-nut.—Head close, egg-shaped, sweet and mild in flavour. Should be sown in March and July and planted 15 inches apart.

Early Battersea.—One of the oldest and best. Said to have been cultivated in London 150 years ago. It is dwarf, with a conical head, does not crack, and is sweet and tender when cooked. It has received numerous names. In the last edition of this work no less than thirty-seven synonyms were cited for it.

Early Offenham.—Much grown by market-gardeners. It forms medium, conical, firm hearts of excellent quality.

Early York.—An old, much-esteemed sort, generally grown as an early crop. It is dwarf, with oval head, and has dark-green leaves with comparatively thin ribs.

Ellam's Early Dwarf (fig. 1170).—Heads of medium size, ovate, compact, of fine flavour. A first-rate variety for autumn sowing, but not so good for spring or early summer sowing.

First and Best.—Heads rather large, conical, very compact, of good flavour. May be had practically all the year round by making monthly sowings.

Flower of Spring.—Heads of medium size, ovate, compact, of a fine delicate flavour. Excellent for spring, early summer, or autumn sowing.

Improved Nonpareil.—Heads of medium size, ovate, compact, with a small spread of outer leaves, very tender and of good flavour. Good for summer, autumn, or spring use.

Little Gem.—Heads small, ovate, and very compact, of a delicate and tender flavour. Excellent for spring or early summer sowing. May be cooked and served whole.

Little Pixie (Tom Thumb).—A small compact-headed sort of excellent quality and very early. Much grown in small gardens.

Matchless.—An excellent small early variety of dwarf, compact habit, turns in quickly and hearts well, very delicate in flavour.

Mein's No. 1.—Heads large, conical, with rather spreading outer leaves, of good quality. A very reliable hardy variety for autumn sowing.

Selected Winningstadt.—Heads large, conical, sharply pointed, moderate spread of outer leaves, of a tender, delicate flavour. A first-rate variety for spring or early summer sowing, but not so useful for autumn sowing.

St. John's Day.—Hearts medium size, roundish, compact, of delicate flavour, and useful for spring, summer, or autumn crops.

Sutton's Earliest (fig. 1171).—Heads rather large, ovate, remarkably compact, of a very delicate flavour, and may be had nearly all the year round.

Sutton's Maincrop.—Hearts large, flattish, rather spreading, and of very good flavour. A first-rate summer and autumn Cabbage, but not recommended for autumn sowing.

RED CABBAGE (*Brassica oleracea capitata rubra*).—Of this, which is principally used for pickling, there are several varieties, differing in the size of their heads and in the depth of colour. The principal are:—

Dwarf Blood Red.—Heads small, round, compact, and of a deep-red colour; excellent for pickling. If sown in spring it is ready for use in the early autumn.

Dwarf Red.—This has a small firm head, and is of finer quality than the preceding.

Red Drumhead.—Heads very large, flat, deep-red, moderately compact. An excellent market variety. Suitable for spring or autumn sowing.

Red Dutch.—Head large, round, or flattened; the sort chiefly grown in market-gardens.

Utrecht Red.—A small but very fine dark-red Cabbage. It may be sown in the first week of April and in the end of July.

Capsicum.—Several species of *Capsicum* are cultivated for their seed-pods, and are popularly known as Chili-peppers. In a green state they are used in salads, in pickles, and for making Chili vinegar; dried and ground, when ripe, they form Cayenne pepper. The frequent adulteration of this condiment with red-lead and other poisonous substances renders the cultiva-

tion of the *Capsicum* in gardens, with the view of obtaining a home-grown supply, very desirable.

Seeds should be sown in February or early in March, in pots or pans filled with light rich mould, and plunged in a hot-bed. When the young plants are about 2 inches high, they may be pricked out singly into 3-inch pots, from which they must be shifted on until in 6- or 8-inch pots, and in these they may be allowed to fruit. The plants should be kept near the glass in a warm vinery, pit, or stove, and water ought to be frequently given. In warm situations in the south of England fruit may be ripened in the open air. With this view plants should be hardened off towards the end of May, and planted out in June, on a border with a south aspect, at 1 foot or 18 inches apart, watering at planting, and subsequently in dry weather. In general, however, it is advisable to depend on plants under glass for a supply of ripe fruit; but where the green pods are in request a considerable portion of the plants may, in warm situations, be turned out-of-doors. The fruit ripens in September, and may be kept two or three years in a dry room. The seed keeps best in the pods, and remains good for four or five years.

Varieties of *Capsicum*, mostly natives of the East:—

Bell Pepper (C. grossum).—An annual or biennial, with large variable-shaped fleshy fruits.

Bird Pepper (C. baccatum), *Piment enragé* of the French, a bushy perennial, with small, round, erect fruits.

Guinea Pepper (C. annum) (fig. 1174), of which there are varieties producing red and yellow, long and short fruits.

Long Yellow Capsicum.—Differs from Spanish Mammoth chiefly in the colour of the pods, which is bright-yellow.

Purple Capsicum.—A robust shrub 3 feet high, with pods 2 to 3 inches long, variable in shape, coloured purplish-red when ripe. Very hot to the taste.

Red Tomato Capsicum (American Bonnet, Bonny, or Bonnet Pepper) is like the preceding, but red; very productive, and much milder than the small sorts.

Shrubby Capsicum (C. frutescens), a bushy perennial, from which Cayenne Pepper is usually prepared.

Spanish Mammoth Capsicum (fig. 1175) has large pods much milder than the other kinds, and excellent for salads.

Tomato Capsicum (C. dulce), *Piment Tomate* of the French, an annual producing fruit like a Tomato in size and form, yellow, and of comparatively mild flavour.

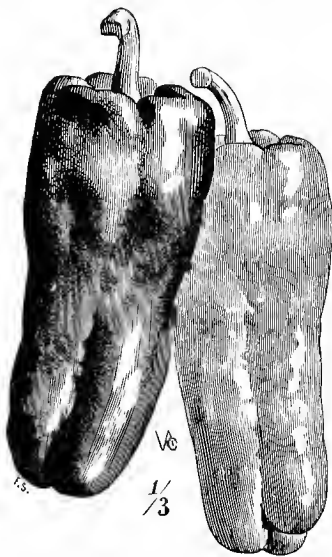


Fig. 1175.—Spanish Mammoth Capsicum.

Caraway (Carum Carui) (fig. 1176).—A biennial, native of Europe, including Britain, where it frequents waste places, growing 1 or 2 feet high, and producing heads of white flowers in July. It has a fleshy Carrot-like root. The seeds are much used in confectionery, and for flavouring spirits and perfuming soap; it yields an oil, which is employed medicinally as a carminative. Considerable quantities are grown in Essex and Kent for these purposes.

Sow in drills 10 inches apart, in light warm soil, in autumn, when the seeds are ripe, or in March or April. When the plants are 2 or 3 inches high they should be thinned out to 8 inches apart; the ground must be kept free from weeds, and stirred by an occasional hoeing. The seeds will ripen in the following year, in July or August.

Cardoon (Cynara Cardunculus).—A perennial, native of Southern Europe. It is closely related to the Artichoke, and may have descended from the same species. It grows to a height of from 4 to 6 feet, and its large pinnatifid leaves are whitish beneath, and in some sorts armed on their margins with fine brown or yellow spines. The flower-heads resemble those of the Artichoke. The fleshy leaf-stalks are the edible part, as in the case of Celery. They are blanched, and, when properly cooked, constitute a tender and excellent vegetable, much esteemed, especially on the Continent. The flowers, like those

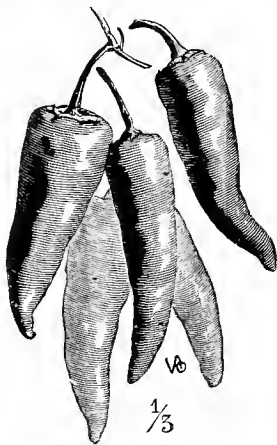


Fig. 1174.—Guinea Pepper (*Capsicum annum*).

of the Artichoke, have the property of curdling milk.

This plant prefers a light, warm, moderately rich soil, and an open situation. All the sorts are raised from seeds, either sown where the



Fig. 1176.—Caraway (*Carum Carui*).

plants are to remain, or in pots under a frame for transplanting. A small quantity to come in early may be sown on a hot-bed about the end of March, but the main crop should not be sown till the middle of April; and where the climate is warm, it is advisable to defer sowing till the end of the month. A sowing for a late crop may be made about the end of June.

Trenches 1 foot deep, 18 inches wide, and not less than 4 feet apart from centre to centre should be prepared, and from 6 to 9 inches of well-decomposed dung should be dug in the bottoms; the seeds may then be sown in the centre of the trench, in patches of three or four, and covered with earth to the depth of about 1 inch. The distance between the patches may be 18 inches. When the plants are 2 or 3 inches high they should be thinned out, only the strongest plant in each patch being allowed to remain.

Some experienced growers choose for the Cardoon a piece of ground in an open position that requires well pulverizing and a rest from heavy cropping. Having marked off the spaces for the trenches and ridges, allowing 6 feet for each, those spaces marked out for the ridges are manured well and dug, keeping in view the improving of the pieces of ground for other crops, as well as providing for the Cardoon. The trenches are next dug out 1 foot deep, laying the soil right and left on the ridges, and breaking the lumps well as the work proceeds. The sides of the ridges should be well sloped off and beaten smooth with the back of the spade. A compost, consisting of equal portions of chopped turfy soil, good half-rotted manure, and road-drift or fine ashes, and, if to be had, some burned clay, is put in the bottom of the trench to a depth of 4 to 6 inches, and forked in in such a manner as to keep the compost merely covered, while the ground below is loosened to the depth of 1 foot. The trench ought then to lie uncropped until the season for planting, by which time the ground will be in fine order for them.

Two rows of dwarf Peas are sown upon the ridges, and a row of Spinach between; these will be off before the Cardoons require earthing up. In the first week in May the seeds are sown in thumb-pots, placing two sound seeds at opposite sides of the pot, plunging the pots in a cold frame, which is kept close until the plants appear, when plenty of air is admitted to prevent drawing. When a fortnight old they will be strong enough to plant out in this order: one row up the centre of each trench, 18 inches apart, and a row 2 feet from it in quincunx fashion on each side.

Planting two plants together is to guard against losses by insects, and when all danger from this is over the weakest can be destroyed. Raising them in pots, instead of sowing them in the ground, is to prevent gaps in the rows, and to give the opportunity of having all the plants in the ridge of equal size, so that when

earthed up, the plants being alike in strength, the same quantity of soil will be required for all. The weakest plants may be kept in the cold frame ten days longer, which, with a second sowing, will give a succession. Water the newly turned out plants, and loosen up the soil between them, which finishes the planting part of the business. In dry weather the plants will require watering once or twice until they get established, after which they will only require to be kept clear of weeds by forking among them occasionally.

In the beginning of October the most forward trench of plants will be ready for earthing up. Take advantage of a fine dry day, and commence by carefully bringing all the leaves into an upright position, in which they should be held by one person, while another fastens a hay-band round the bottom of the plant, and winds away until the whole of the stalk is bound round and the end of the band secured. The stalks should be brought closely together, but not too much compressed. Proceed in this way until the trench is completed, and then earth up till the bands are covered with the soil, which should be pressed very tightly round the plant at the top to exclude air and moisture as effectually as possible. Proceed in the same manner with the remaining trenches when fit.

Blanching is also accomplished by fastening the leaves closely together with string or matting, then placing an earthen drain-pipe over the plants, and filling up with sand. This plan answers admirably; the whole of the leaf-stalks being perfectly blanched, quite crisp, and fit for use. Its adoption prevents the loss of space occupied by the ridges, as no soil is wanted for earthing; but it takes a pipe 7 or 8 inches in diameter for a well-grown plant, and these are expensive.

Cardoons are fit for use in about three weeks after tying up. At the approach of severe frost it is advisable to protect the plants with litter. In France, before severe frost sets in, the plants, having been tied up for about a fortnight, are taken up with balls on a dry day, and replanted close together in a cellar, where the process of blanching is completed. Thus treated they are said to remain good till March. Or they may be kept in a trench 4 feet wide and 3 feet deep in a piece of dry ground, the sides lined with a good thickness of straw, against which one or two rows of Cardoons are placed, the extremities of the leaves being left above-ground, then another layer of straw, and another row of plants, till the trench is filled. The plants are

sheltered from rain, and protected from frost by long litter, which is always removed in mild weather.

Cooking. — After the Cardoons have been trimmed and washed, and their outside leaves removed, they are cut into pieces 4 inches long, placed into a pan of cold water and boiled until the outer skin can be easily removed with a cloth. After this they are well washed, and again boiled in good stock or broth. They are served very hot with brown sauce made with good gravy. It is an improvement in serving Cardoons to put some marrow round them.

The common Cardoon has spineless leaves, leaf-stalks solid, but not so thick nor so tender when cooked as those of the other varieties; it is also apt to run to seed. The Spanish Cardoon has spineless leaves with large nearly solid ribs. Like the preceding, it is apt to run to seed.



Fig. 1177.—Tours Cardoon.

The leaves of the Tours Cardoon (Fig. 1177) are excessively spiny, so much so that great care is requisite in working among the plants, for the spines are long and very sharp. Notwithstanding this drawback, the variety is much cultivated in France on account of its large, thick, solid, tender ribs. The plants are not so liable to run to seed as those of the preceding varieties. The red-stemmed Cardoon is an excellent variety recently obtained from Marseilles. Leaves nearly smooth; ribs tinged with red, very large and solid, not apt to run to seed; but scarcely so hardy as the Tours Cardoon.

The Puvis Cardoon is remarkable for its strong growth, the large size it attains, and the thickness of its ribs, which are almost solid. The leaves are thick, not prickly, or only very slightly so. It is a fine variety, of more tender substance than the Cardon de Tours.

Carrot (*Daucus Carota*).—A hardy biennial, native of Asia, Africa, and Europe, including Britain, where it is found wild very commonly by roadsides and on dry banks, especially near the sea.

The roots of the wild Carrot are small, hard, and frequently much forked; but that it is the parent of our cultivated varieties has been proved by M. Vilmorin, who succeeded in obtaining, in three generations, roots of considerable size. Some of the roots so obtained were as large as garden Carrots of the largest size, and their appearance was exactly the same; the flesh, however, was more compact and the flavour milder. By most of the persons who tasted them they were considered to be superior to the old varieties.

Soil.—A deep sandy loam is best for Carrots; sandy alluvial soil, properly drained, will suit them, and heavy crops have been obtained on peat. It is essential that the soil should be of a soft pervious nature, to permit the tap-root to descend perpendicularly, which it will sometimes do to the depth of 3, 4, or even 5 feet under favourable circumstances. Cold stiff clay soils, and others that are too compact, should be avoided, for in such the tap-root cannot penetrate in its natural direction, and the Carrots become forked, as will likewise be the case in stony land. The Short Horn varieties may be grown on rather thin soil; but the long-rooted sorts ought to have a depth of 1 or 2 feet.

Manures.—Lime, potash, soda, and chloride of sodium may be applied with advantage as manures. Farmyard manure laid on the surface and dug in is apt to make the roots fork. The best way of applying it is to trench the ground, and, in so doing, to let the manure be placed not nearer the surface than 18 inches. In this way even fresh stable manure may be applied. Carrots are, however, generally sown without manure in soil that has been well manured for the preceding crop.

Preparation of the Ground.—The ground, if not trenched, should be double dug and thoroughly worked, so that it may be of uniform consistence, and not richer at the surface than lower down. The tap-root will then strike down quite perpendicularly, but if the soil is rich near

the top, and hard or poor below, the root will be apt to fork. Short-rooted varieties, however, may be grown in a depth of about 6 inches of good or prepared compost, laid on the top of a soil of inferior quality. Frequently none of the soil of a garden is of the best description for the production of Carrots. It may be too heavy; if so, it probably can be mixed with a large quantity of sand, or sand and mud, the latter being of a light nature when dry; or clay and heavy soil may be burned and incorporated with the mass, and if sand can be added so much the better. Peat may also be employed in lightening the soil.

It is always best to trench and ridge up the ground before winter, taking the opportunity of dry weather in spring to break down the ridges and pulverize the soil. Or holes 18 inches deep may be made with a large dibber, about 3 inches in diameter, and filled with prepared sandy compost. A few seeds may then be sown in each of the holes, and when the young plants come up, only the best one should be allowed to remain. Fine large Carrots have been produced by this mode where the soil was unfavourable to their growth.

Sowings.—Near Paris the first sowing of Early Horn is made in September, in the open ground, covering with litter in frosty weather; and from this sowing Carrots are obtained fit for use in May. There is no reason why this plan should not prove successful in this country, for the frosts are generally more severe in winter near Paris than near London. A small quantity of Early Horn should be sown on a warm border in January, or in the first week of February. Another sowing of the same sort, together with some of Long Horn, may be made in the last week of that month, or in the first week of March. The main crop of Long Horn, Altrincham, and other large sorts for winter use should be sown between the middle of March and the middle of April. If the weather and state of the ground be favourable, the earlier period will be proper in the northern parts of the kingdom. In warm soils, in the southern part, the middle of April will be early enough for the main crop. Small successional sowings of the Horn kinds may be made in June and July; and, finally, in the first or second week in August, a sowing of Early Horn for spring use may be made in a situation where some protection can be conveniently given during severe weather.

Carrots are either sown broadcast on beds, usually about 4 feet wide, or in drills; the latter

method is preferable, as less seed will suffice, and the plants can be thinned more regularly. For Early Horn and similar small sorts the drills should be 8 inches apart, and the plants should be thinned to 4 inches apart in the rows. Altrincham, and others of similar growth, may be 10 or 12 inches from row to row, and the plants 6 inches apart in the rows. For larger sorts the rows may be from 12 to 15 inches apart, and the plants may be thinned to 6 or 8 inches asunder in the rows. In soil where the Carrot attains a large size, more space should be allowed than where smaller roots and tops are produced. In general, 12 inches between the rows, and 6 inches from plant to plant in the row, will be about a proper average distance. On strong soils where the roots become objectionally coarse if given much room, they may be left thicker in the rows. The edges of the drills may be smoothed down with the back of a hay-rake, or a little fine light soil may be put over the seeds, and in all cases where the ground is in good condition as regards dryness, a light roller should be passed over the whole surface of the ground. Care should be taken to insert a small stick or two at each end of the rows, so that the intervals can be hoed if weeds start up before the Carrots themselves appear.

As soon as the plants can be handled, they should be thinned at first to half the distance at which they are to remain for full growth: the intermediate ones will serve for drawing young. After thinning, the usual routine of weeding and hoeing must be persevered in; but the surface should not be deeply loosened, as this encourages forking.

In cold soils, and in sunless weather, the seeds lie long in the ground without germinating, and under such circumstances they would be as well in the seed-room. But to obviate this the seed may be steeped for twenty-four hours, and then kept in a temperature of about 55° till germination commences, when they may be sown in the open ground. This plan may be advantageously adopted in cold situations, and where, from much wet, the ground cannot be worked at the proper time for sowing.

The seeds of the Carrot are apt to lose their germinative powers; it is therefore advisable to test them before sowing by placing a few in a flower-pot in gentle heat; when they come up, the proportion of good and bad seed in the lot can be ascertained.

Taking the Crop.—Carrots are drawn young as required. The main crop is taken up at the

end of October or beginning of November, a dry day being chosen for the operation. This is performed by loosening the root with a fork, pulling by the top at the same time. Some cut off the tops a little above the crown; others cut off a small portion of the latter so as to remove all the crown-buds. We prefer cutting close to the crown, but not into the skin of the upper part of the root.

The roots should be stored in sand scarcely moist, but by no means over dry. The situation in which they are stored cannot be too cool, provided the roots are safe from frost. An underground cellar is not the best place, an open shed being better, or a loft with an open shed below, covering them with as much sand as will prevent them from being affected by sudden changes of temperature. To store a large quantity in an open shed, select the longest roots for the lowest layer; lay them shoulder to shoulder, with their crowns towards the wall, but close to it; then place another layer in the same way, but with their crowns opposite to those first laid. Proceed thus with other layers, selecting always the next longest roots to those which formed the preceding layer, and consequently finishing with the shortest roots. The whole should then be covered with well-dried straw or fern. They may also be thus arranged in the open ground, if it be dry, and then covered over with thin dry turf, leaving some openings stuffed with straw, to afford ventilation.

Whatever mode of storing is adopted, no great bulk of roots should be put together, otherwise fermentation may take place, and the flavour of the Carrots consequently spoilt. In soils where maggots do not attack the roots, they may be left in the ground till towards spring, care being taken to cover them with litter in case of frost. Late-sown breadths to be left in the ground, and tender young roots drawn as required. In order to be able to do this in frosty weather, protect with a good thickness of straw litter.

To save Seeds.—This may be done either by leaving some plants in the ground, and protecting them from frost; or, in taking up the crop, some of the finest specimens may be selected, their tops cut off at some distance from the crown, and preserved in sand till February or March, when they should be planted out about 18 inches apart in good soil enriched with decomposed manure. As the umbels successively ripen their seeds they should be cut off, and laid on a seed-cloth in the sun, to get thoroughly

dry for rubbing out. Some recommend hanging up the stalks and rubbing out the seeds when they are wanted for sowing. Seeds of more than one year old cannot be depended upon.

Forcing.—The best sorts for forcing are Parisian Forcing and Early Short Horn; they may be sown on a hot-bed in the end of November or beginning of December; again in the middle of January; and again early in February, if the weather be severe; otherwise this sowing may be made on a warm border. A hot-bed 3 or 4 feet thick of leaves, or of 15 or 18 inches of dung, should be prepared, and covered with 8 inches of sandy soil and leaf-mould, so that the surface may be within about 6 inches of the glass. The seed may then be sown either broadcast, or in shallow drills, 4 inches apart, and covered with fine mould to the depth of $\frac{1}{2}$ inch. When the plants come up they should be thinned to $1\frac{1}{2}$ inch apart in the row, or to 2 inches from each other if sown broadcast. The temperature may be from 60° to 65°, and the sashes must be covered at night and in frosty weather; but as much light and air as possible should be given. Cold draughts should be avoided; and if the soil should get too dry, a gentle watering may be given. Radishes are frequently sown along with Carrots, the rows alternating, and the Radishes will be ready for use before the Carrots require all the space. Carrots may also be forwarded considerably in rough or unglazed frames, and on raised beds with only stakes and mats for coverings. In each and every case a very mild hot-bed only is desirable.

Insects, &c.—See chapter on this subject.

Bird and Flower Enemies.—Carrot Blossom Moth. **Fruit and Seed Enemies.**—Carrot-seed Moth. **Leaf Enemies.**—Carrot Aphis, Common Flat-body Moth. **Root Enemies.**—Carrot Fly, Daddy Long-legs, Field Mice, Millipedes, Wireworms, Yellow Underwing Moth.

The principal varieties of Carrots cultivated in gardens are:—

Altrincham.—Leaves long; root large, tapering slightly, but ending rather abruptly in a small tap-root; the surface is rather uneven and wrinkled. Flesh bright reddish-orange. One of the very best sorts for garden culture; a favourite in the Paris market.

Blunt Guérande (fig. 1178).—Root 4 to 6 inches long, very blunt at the apex, grows quickly and to a good size. Flesh orange-red, yellow inside, tender, and sweet. Succeeds best in a light soil.

Early Nantes.—Root cylindrical, with a blunt point, even and clean; red, sweet and tender, coreless. One of the earliest and best. Prefers a mellow deep soil and moisture.

Early Scarlet Dutch Horn.—About twice as long as wide, nearly cylindrical, with a long fibrous tap-root. Flesh reddish, heart yellow. This is the kind chiefly grown for early use by the market-gardeners round

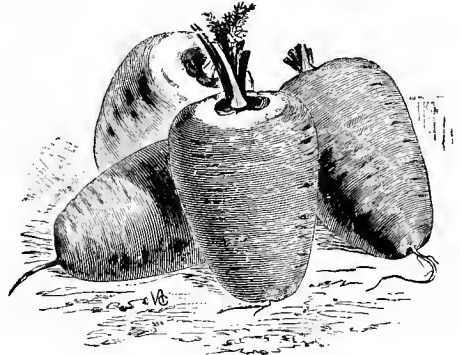


Fig. 1178.—Carrot—Blunt Guérande.

London. For that purpose it is sown in November, in frames and hooped beds, and protected with mats.

Early Short Horn (French Horn) (fig. 1179).—Leaves few and dwarf; root short, globular or top-shaped; orange-



Fig. 1179.—Carrot—Early Short Horn.

red, reddish-yellow when young. One of the earliest, and best for forcing.

James's Intermediate (fig. 1180).—One of the best; a favourite in England. Root thick, tapering, orange-red; very vigorous and productive.

Long Horn (Long Red Dutch).—Leaves few, moderately long, and slender; root long, cylindrical, ending abruptly, like all the Horn Carrots; surface rather uneven and wrinkled. Flesh reddish-orange, tender, very juicy, and of excellent flavour; heart small, and nearly of the same colour as the flesh. An excellent sort for summer use.

Long Orange.—Leaves long; root thick at the shoulder, thence tapering regularly to its extremity. Flesh orange, heart pale-yellow. Formerly more generally cultivated, but its quality is inferior to that of the Long Red.

Long Red (Long Surrey).—Leaves of moderate length; roots long, tapering regularly to their extremity. Flesh reddish, heart yellow. This and the Altrincham are the best two for the general crop.

Parisian Forcing.—Leaves few and short, roots small and almost spherical, tender and sweet, an excellent forcer.

White Belgian (fig. 1181).—The largest known, and succeeds in soils too strong for the finer varieties. It is



Fig. 1180.—Carrot—James's Intermediate.

better adapted for the field than the garden. The leaves are strong and tall; roots very thick, a considerable portion rising above the surface of the ground, acquiring a greenish tinge when exposed to the light. It cooks tender, but its colour is not pleasing.

Cauliflower (*Brassica oleracea Botrytis*).—A variety of the Cabbage in which the inflorescence is pushed up early and arrested in its development, the flower-stalks thickening whilst the true flowers are changed into mere points, the whole forming a dense compact succulent head. It differs from the Broccoli only in being more tender and less coarse in growth, and in its being cultivated for summer use. Nothing appears to be known of its origin. Miller says it was introduced into England and the continent of Europe from Cyprus, and that probably it had been brought to the latter place from some other country. It appears to have been cultivated for ages in the island of Cyprus and on the coasts of the Mediterranean. Unprotected, it would rarely withstand the severity of our winters.

Soil.—A rich, highly manured soil, such as that recommended for Cabbages, will suit the Cauliflower. It should in all cases be well drained, but a soil that is too dry is not well

suited for the summer crop, as it induces the plants to "button", that is, to form a very small heart.

The manures recommended for Cabbage and Broccoli are equally serviceable for the Cauliflower.

The Walcheren is especially valuable in hot dry summers, when scarcely a head of the ordinary sorts could be obtained, this forming beautiful large, white, firm heads, of uniform closeness. To obtain a regular supply till the end of the year sow seeds of it the third week in April, middle and end of May, the middle and end of June, and the middle and end of July.

Sowings.—Where the climate is neither too cold in winter, nor too hot and dry in summer, the Cauliflower flourishes at all seasons, and may be sown at any time without danger of not forming a head. But it is different with us; for we cannot sow at all seasons with success, owing to the plant not being able to withstand the severity of our winters. The sowing may be made so late in summer that the winter will arrest the growth of the plants just before they commence to form a head; but, being too late to do that, they will at the same time be too early for keeping over the winter. They might be protected, but from having to linger so many months in an advanced state of growth, they would not form good heads on the return of active vegetation in the spring.

Autumn Sowing.—The time for this is about the 20th of August. In the warmest parts of the kingdom it may be as late as the 25th of August; in the north of England about the 15th; and in Scotland from the 1st to the 15th, according to the nature of the soil and climate. The seed-bed should be in an open situation, well exposed to light, and the soil rich and friable. Sow the seeds in drills 4 inches apart, and if the weather is hot and dry, cover the surface with a mat, or other material, till the

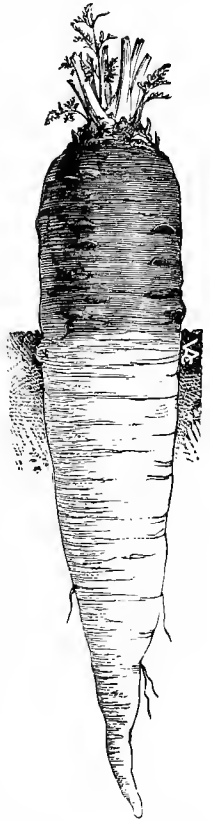


Fig. 1181.—Carrot—White Belgian.

seeds begin to push. About three weeks after the plants appear above ground, they should be pricked out 4 to 6 inches apart, in good soil, in a shallow cold frame. From the time the plants are established till they are removed in spring, they should be exposed to as much light and air as possible. Except in case of heavy rain, they may be left uncovered till frosts occur, when the sashes should be put on at night. When frost continues night and day, the sashes must be kept close and covered with mats or straw; before planting out, the sashes should be dispensed with, in order that the plants may be hardened off. If any plant is affected with mould or mildew, it had better be removed; some flowers of sulphur may be scattered in the frame by means of a sulphurator. Slugs and other enemies should be carefully looked after, and to prevent their attacks a little quicklime may be strewn along the sides of the frame; and if some be scattered all over, it will do the plants no harm. If only a few dozen plants are wanted, these may be wintered singly in 4-inch pots, either in a cold pit or frame, or else on shelves in a house heated only to keep out severe frosts.

In the end of February, or as soon as the weather proves favourable, some of the plants should be taken up with good balls or moved out of pots, and planted out in rich well-manured ground, in patches of three or four, so that they may be covered with a hand-glass. Air should be given more or less freely according to the state of the weather. When the plants get too high for the hand-glasses, the latter should be raised by placing bricks beneath the corners, or, better, by putting another hand-glass on the top of the first. Dry turfy soil may be packed round the plants up to the lower leaves; at the same time a little earth may be drawn against the lower edges of the hand-glasses, when these are raised on bricks, to prevent a draught of air. The top of the hand-glass will require to be removed when the plants become large, and ultimately the whole of it.

Cauliflowers wintered in frames may, however, be obtained earlier by the following mode, which is practised near Paris. The cold there in February is generally greater than it is at the same period in this country; we may therefore properly adopt the plan, even in cold situations. In the beginning of February a trench, about 18 inches deep, is filled with equal parts of dung and leaves, in alternate layers, to the height of 15 inches, in order to produce a slight bottom-

heat. The dung and leaves are covered to the depth of 9 or 10 inches with a mixture of one-half decayed dung and one-half soil. Ten or twelve days after this is done, the Cauliflowers are planted, 20 inches apart, and covered with *cloches* or bell-glasses. Under each of these, four Cabbage-Lettuces are also planted. Some dry litter is placed between the glasses, and in severe frost they are covered with straw-mats. In this way Cauliflowers are obtained fit for use in April.

Instead of wintering in frames, Cauliflowers are frequently planted out in the end of October or beginning of November, in patches 3 feet apart each way, and protected through the winter by hand-glasses. Six plants or more may be sheltered under each hand-glass during the winter; but with the exception of four or five, according to the size of the hand-glass, all should be removed in spring as soon as the weather will permit.

Sometimes Cauliflowers are placed in front of a wall in the following manner:—A trench is taken out a foot wide, and not so deep as in any way to interfere with the roots of the trees. In this about 6 inches of stable-manure should be placed, and covered over with rich soil. The plants should then be put in at 6 inches apart. In spring remove two plants and leave one alternately: those removed may be planted out elsewhere. After the Cauliflowers are cut, the dung put in the bottom of the small trenches should be turned out and incorporated with the soil of the border, otherwise the roots of the trees might be induced to run in it too near the surface, and consequently be liable to be destroyed by future diggings.

Near London the autumn-sown Cauliflowers are pricked out 4 inches apart, in beds in the open ground, and protected by means of hoops and mats. In this way they are generally protected sufficiently from frost and rain; but in continued severe weather the plants are apt to suffer from the want of light, and are then disposed to damp off. The labour required for covering and uncovering is considerable, and mats are not only expensive, but are soon worn out; glass will be doubtless found a cheaper covering in the end, as well as the best adapted for the healthy growth of the plants.

Winter and Early Spring Sowing.—In order to obtain plants to form a succession to the crop produced by the autumn-sown plants, it is necessary to sow early in the season. The seeds are sown on a moderate hot-bed, and the plants reared under glass. They must not be

made to grow rapidly; a slow, regular, substantial growth is what we should endeavour to promote. If the weather be unusually mild for the season, let the plants have as much air and light as possible; they will then better resist the effects of continued severe weather which may subsequently occur.

The sowing should be made about the middle of February, on a moderate hot-bed. When fit, the plants should be pricked out as directed for the autumn sowing; they may very well occupy the frames in which Lettuce plants have been wintered. They should be planted out, some in the end of April and some in May; Dean's Snowball to be 18 inches asunder in rows 2 feet apart; the Walcheren and Dwarf Erfurt, 2 feet apart each way; the others, 2½ by 2 feet. If the potting system be adopted, sow the Walcheren about the middle of February; pot and shift as before directed. Where this system is not adopted it is advisable to have some portion in pots, as, in case of emergency, recourse could be had to various means of bringing in the potted plants for use, when a failure in the supply might otherwise occur.

Besides the sowing in the middle of February for a principal succession crop, a small sowing may be made in heat in the first week in January, in case of clubbing or other accident to the autumn-sown plants; and another small sowing, also on gentle heat, may be made in the beginning of March.

Late Spring Sowing.—In the first week in April a sowing should be made in the open border. The plants may be pricked out, when fit, to 6 inches apart by 4 inches, but generally they are allowed to remain in the seed-bed till required to be finally planted out in June. This sowing should include Walcheren, as it is not so liable to form buttoned heads as the other kinds.

Veitch's Autumn Giant ought to be the most extensively grown. If good batches of this invaluable variety are raised in February under glass and again early in April in the open, these would carry on the supply till autumn Broccoli are abundant, this quite obviating the necessity for sowing the smaller and less reliable varieties so late as formerly—or say, later than March or early in April. If extra fine heads of this or any other Cauliflower are desired, give occasional thorough soakings of liquid manure, more especially when hearting commences. The heads may be cut when they are 2½ inches in diameter, and from that till they attain their full size, but before they lose their compactness.

They should be protected from caterpillars, and never be exposed to sunlight, which spoils their whiteness.

Preservation from Frost.—When the head of a Cauliflower has once commenced to form, it will increase in size in the dark and without the assistance of the roots, if kept in a mild temperature. It draws substances for its formation out of the succulent stem; the heads may therefore be preserved for use, for a considerable time, by any means that will secure them from frost and damp. A nearly steady temperature, between 40° and 45°, will maintain vegetation; a gentle circulation of air will be sufficient, for if too great it would be apt to exhaust the juices of the plant, and to render the heads tough. Some recommend suspending the plant head downwards in a place free from damp; others take up and replant in dry sandy soil in an open shed: this is a more natural plan than the preceding. Some bury the heads in dry earth, leaving a portion of the root sticking out above the ground to lay hold of in pulling up the plant. The head may also be divested of most of the leaves, and buried in peat. By these and similar means Cauliflowers may be preserved in a fit state, so far as appearance goes, and even very good as regards flavour if no decayed leaves are allowed to remain.

Large bell-glasses, with night-caps of frigidomo, would answer well for protecting dwarf Cauliflowers from such frosts as usually occur in November, or even till near the end of December. Glazed protections to extend along a row could be constructed at little expense. They might be in the form of a ridge-roof, or they might be 6 feet in length and 18 inches in breadth, with an upright glazed front 15 inches high, a wooden back 18 inches high, and a glazed top hinged to the back sloping 3 inches to the front, and adapted for readily giving air when the weather permits.

Forcing.—Since the introduction of extra late Broccoli, which carry on the supply till quite late in May, there has been far less need for forcing Cauliflowers. As a rule the latter can be had, with the aid of hand-lights, quite as early as wanted, but there are seasons when Broccoli are destroyed wholesale by a severe frost. It may then be very desirable to forward Cauliflowers as much as possible. They will not stand hard forcing. Reference has already been made to a plan of forwarding adopted by the French, and a modification of this practice might well be tried in this country, rough

frames and glazed lights being substituted for bell-glasses, in the use of which British gardeners are none too expert. For frame-culture and for gentle forcing generally Dean's Snowball is the best variety. If a stock of plants has not been raised in the autumn and wintered under glass, sow seed in gentle heat early in January. Thin out the plants early, and raise the pans or boxes well up to the glass, with a view to keeping them sturdy. Prior to pricking out in boxes, or placing singly in $2\frac{1}{2}$ -inch pots, the latter preferably, harden the stems by means of a week's change to a shelf in a cooler house, but return to a light position in gentle heat after pricking out or potting. Before the plants become root-bound shift to where they are to attain their full size. Only a very mild hot-bed is needed for them, and this should have a covering of from 6 inches to 8 inches of moderately rich, loamy soil. Arrange the plants 15 inches apart each way, and plant rather firmly. They must be kept only moderately warm, the top heat, without air, seldom exceeding 55° , airing them freely on mild days, and drawing off the lights completely on very warm days. The plants must never become dry at the roots, and liquid manure should be given freely directly hearting commences. Very large hearts will not be had in this way, nor are they particularly desirable, good cooks preferring neat close hearts about the size of a cricket-ball.

Cauliflowers can also be grown successfully in 9-inch pots. Use rich, loamy soil, pot firmly, keep the plants near the glass in a warm pit, attend well to the watering, and use liquid manure freely from the time the roots have taken full possession of the soil. With the aid of heated pits and rough frames on mild hot-beds, glazed or only protected with mats, a succession of very good Cauliflowers can be had from April to the end of June.

To save Seeds.—Seeds are best obtained from autumn-sown plants which have been wintered in a frame, and well supplied with water during the whole period of their growth. The selection should be made, and the plants marked, when the heads are in perfection. Plants having short thick stems, with firm heads of a fine white colour, should be preferred. Any that exhibit a disposition to form heads before the generality should be watched, and if with this disposition they do not quickly break the curd to run to seed, there is a chance that seeds saved from them will be the best for early produce.

Diseases and Insects.—See under CABBAGES.

Alleaume Dwarf.—A short-stemmed early variety, with broad, wavy, twisted leaves. It forms a head quickly, and should be cut early.

Dean's Early Snowball.—Of the Erfurt type, but dwarfier and earlier, maturing quickly, being ready to cut in four months from the time of sowing. Stems very short; leaves short, narrow, pointed, of a silvery-green; head white and very close.

Dwarf Erfurt (fig. 1182).—One of the earliest; grows about a foot high; leaves short; head compact, large, white, if protected from light. One of the best for forcing.

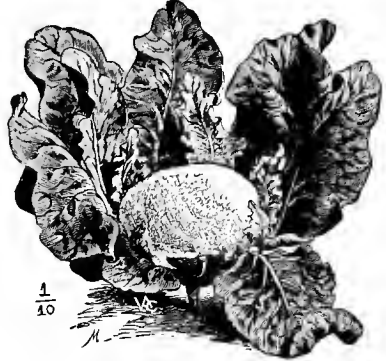


Fig. 1182.—Cauliflower—Dwarf Erfurt.

Early London (Early Dutch).—A large, hardy, rather tall Cauliflower, with a fine white, compact head. Largely cultivated near London for the early crop, and in Holland, France, &c., for the English market.

Large Asiatic.—A very fine late variety, with large dark-green leaves and a short stem. A sturdy grower, valuable on account of its lateness. Should be sown in May for autumn use.

Large White French.—A large variety, with a long stout stem, long wavy dark-green leaves, and a firm com-



Fig. 1183.—Cauliflower—Lenormand's Short-stalked.

pect head. One of the hardiest, and may be grown successfully in the open.

Lenormand's.—One of the hardiest. Stem about 15 inches high; leaves broad, and waved on the margin; head about 9 inches across.

Lenormand's Short-stalked (fig. 1183).—Stem very short; leaves short, broad, wavy, very firm, spreading, exposing the head, which is large, pure white. One of the best.

Veitch's Autumn Giant.—A valuable and distinct variety. Head large, firm, compact, white, well protected by the foliage. Sown in April or May, it forms a capital succession to the Walcheren; plants from a sowing made the second week in April yield firm solid heads by the first week in September. May also be sown in the autumn and the plants protected in cold weather to afford hearts in the following August.

Walcheren (Walcheren Broccoli).—An excellent sort, originally introduced from Haarlem under the name of Early Leyden. The stem is rather dwarf; leaves broad, less pointed, and more undulated than usual. It resists cold in winter and drought in summer better than any other Cauliflower.

Celery (*Apium graveolens*).—A hardy biennial, a native of Europe, &c., including Britain, where it is found wild by ditches and in marshy situations. It appears to have been cultivated by the ancients. Except the forms cultivated for their fleshy roots (*Celeriac*), which are eaten when cooked, the variations from the wild plant are only in the length and consistency of the leaf-stalk. The quality of any particular variety is much influenced by that of the soil in which it is grown.

Soil.—A light rich and rather moist soil is best adapted for the growth of Celery. Although the plant requires plenty of water, yet it is apt to rot in winter in cold wet soils. Provided manure is at command, a poor light soil is better than one that is stiff and rich; for the growth can be made to depend chiefly on the manure supplied, and the plant grows better when its leaf-stalks are surrounded with light porous soil than when it is pressed against by that which is heavy and compact. The latter is mechanically injurious; for though the expansive power of vegetation in its natural state is very great, yet the blanched heart of a Celery plant, not being in its natural state, cannot force its way against such heavy obstructions as it would do when in possession of its full vital energy; and when too much loaded or pressed by soil of a heavy nature, it must rot. Light sandy loam, well manured with cow-dung, produces good Celery, provided plenty of moisture be afforded. Good peat soil, limed and manured, will also produce Celery of superior quality.

Sowing.—For the early crops the seeds should be sown in heat, and for the latest crop on the open border. For a very early small crop a sowing should be made in the end of January or beginning of February, in a pan of rich soil in moderate heat. As soon as the young plants have made three leaves they should be pricked out in boxes filled

with decomposed dung and leaf-mould; afterwards they should be kept near the light, and not allowed to draw for want of air. Any vinery, Peach-house, or frame where the temperature is from 50° to 55° will be suitable for them. This temperature will be about that of the open air in May, so that when the plants are then finally planted out they will receive no check, the temperature to which they are exposed being not lower than that to which they had previously been accustomed. These remarks apply also to other sowings made in heat.

The first sowing for autumn use should be made in gentle heat, under glass, in the first week of March. When the plants have formed three leaves they should be pricked out 2 inches apart in a compost of leaf-mould, very rotten dung, and a little rich friable loam, the whole well mixed, and laid to the depth of 4 inches on very slightly heating materials, and covered with a frame and lights, or with hand-glasses, if the former are not at command. When the leaves begin to meet, the plants should be again transplanted into the same kind of soil as before. The roots must be kept quite moist from the instant they are taken up until they are again placed in the earth. The tap-root ought to be a little shortened, especially if it be long in proportion to the lateral fibres. The plants should be inserted in rows 6 inches apart, and about 4 inches from each other in the rows. Water should be given as the planting proceeds, and afterwards it ought to be liberally supplied when required. In fine weather the sashes should be drawn off during the day; indeed, they will only be required for protection from the cold at night, and from frost, snow, and hail.

A second sowing should be made in the end of March, either in a frame or under hand-glasses. Bottom-heat may be dispensed with; but the frame or glasses should be kept close and warm until the plants appear, when air should be freely admitted. The plants ought to be pricked out in the same kind of soil as that recommended for the previous sowing, and in the same manner, only not on bottom-heat.

Before these seedlings are in danger of being overcrowded, a piece of ground with a hard surface should be selected for a nursery-bed, and a compost be formed, consisting of rotten dung, leaf-mould, and about a fourth part of rich friable loam, the whole to be well reduced by chopping and turning. This compost must

be laid on the firm surface to the depth of 6 inches, and thoroughly watered. As soon as the water has subsided, and the compost is not too wet for working, the plants should be transplanted to 4 inches apart, in rows 6 inches asunder. Care must be taken to keep the roots moist while out of the ground, and to shorten the long tap-roots before planting.

A third sowing for a late crop may be made about the middle of April, on rich soil or compost, on an open border facing the south. The plants, when fit, may be pricked out, and afterwards transplanted to a nursery-bed; or, if raised thinly, they can be transferred direct to the trenches. A small sowing for a very late supply may be made in May.

Preparation of the Ground.—Most of the largest Celery is grown in trenches; and in cold retentive soils this is doubtless the best mode, as the ridge can be made to throw off the water in winter—an advantage which the flat-bed does not possess. For winter Celery, trenches are certainly to be preferred; and if large heads are not desired, the plants may be put closer together, say at 6 inches apart, in trenches $3\frac{1}{2}$ feet apart; this in preference to planting in double rows.

The ground having been selected, the direction of the trenches, their distance apart, and their width should be determined. Their direction ought to be north-and-south, as admitting the fullest exposure to light. The distance should be greater for tall than for dwarf-growing sorts. It ought not to be less than 3 feet from centre to centre of the trenches, nor more than 6 feet. In small gardens very good medium-sized heads may be produced in trenches 3 feet apart. When soiled up, the ridges will necessarily be thin, and will consequently be easily frozen through; but this objection may be obviated by covering them with litter. Celery, as large as need be desired, and of better quality than that grown to a larger size, may be produced in trenches 4 feet apart. In general, this may be considered a good distance. Where ground is plentiful, 5 feet may be allowed; and where the object is to have large examples, the trenches may be 6 feet apart.

Some growers make the trenches a spade's width or about 12 inches, others 15 inches, and some as much as 18 inches. For general purposes they should not be less than 15 inches wide at bottom, and to this width the soil should be worked out and manured. When the distance between the trenches is 4 feet or upwards, they may be formed 18 inches wide.

The depths of the trenches depends, in some measure, on the quantity or depth of manure intended to be introduced into them. The market-gardeners near London dig the trenches two spades deep, fill in a foot deep of strong manure, and over that 3 or 4 inches of soil, and in this the plants are inserted. Near Manchester, where excellent Celery is produced, the trenches are taken out 18 inches wide and 1 foot deep, then 9 inches deep of compost is introduced; so that the plants are thus within 3 inches of the original surface. Where much manure is employed, as is the case near London, the depth of the trenches will require to be a little more than 1 foot; and where little manure is used, they should be more shallow; but in most cases 1 foot may be considered a proper depth.

The trenches should be cut with the sides as nearly perpendicular as the texture of the soil will permit, except near the top. They should be made, if possible, as wide at the bottom as at 9 inches above it. The other 3 inches next the surface, together with the soil taken out of the trench, ought to slope backwards. The object of this is to form a wide receiver for rain, and to expose the plants to more light.

The trenches ought to be got ready as early in the summer as possible. Not only does this admit of the ridges between being cropped with Lettuce, Kidney-Beans, Peas, and Onions, but it also allows good time for the soil and manure in the trenches to become mellowed. If got ready well in advance of planting-time, advantage can always be taken of a showery-time to move large numbers of Celery plants under very favourable conditions.

The manure for the trenches may consist of a mixture of horse and cow dung, or these mixed with old rotten dung, or a compost of rotten dung and fresh maiden loam, and if leaf-mould or a little peat-soil can be added, so much the better. Horse-dung should not be used in a dry littersy state; it should be partially fermented, turned, and watered, till reduced to a moist consistency. The manure is usually turned over, and some soil turned up for planting in; but if the bottom is of a cold nature, it is better to use some of the top-soil for this purpose, unless indeed the trench contains a sufficient depth of compost into which the plants can be inserted.

The plants should be carefully taken up with balls by means of a trowel, and placed upright side by side on a hand-barrow. Previous to planting, every offset or side-slip may be re-

moved. The distance asunder at which the plants may stand in the row varies from 6 to 18 inches. These are extremes; the latter should only be adopted where large heads are to be grown for competition. When the plants are far apart, they grow too strong, fibrous, and coarse. This may well be avoided by planting 8 or 9 inches apart in the rows.

Planting in Beds.—The ground should be marked out in 6-foot widths, and in such a position as the rows, when planted across them, will be north-and-south; the surface of the ground in the intervals will thus be directly exposed to the heating influence of the sun's rays at noon; whilst both sides of the row will be equally exposed to light. Each alternate 6-foot space is dug out about a foot deep, and the soil laid right and left on the intermediate spaces. If the ground has not been previously trenched, the bottom, after the foot of soil has been taken out, should be deeply dug over, especially for late Celery, in order that superfluous moisture may pass downwards. The directions for the manure or compost for the trenches are also applicable to the beds. Near Edinburgh, where the bed system is preferred by the market-gardeners, the plants are placed 9 inches apart, in rows 14 inches asunder. Nicol directs that the rows should be 20 inches asunder, and the plants 8 inches from each other in the row. This gives 122 plants per rod, instead of 155, as by the former distances; but the rows may be 16 inches apart, and the plants 8 inches from each other in the rows; then the rod will contain 152 plants, very nearly as many as is obtained by the present Edinburgh practice. The greater space between the rows must be an advantage in earthing up, while the distance of 8 inches between the plants in the row will be sufficient for the size to which Celery in beds is required to be grown.

Subsequent Culture.—This chiefly consists in watering, stirring the surface of the ground, keeping it clear of weeds, removing suckers or side-shoots, and blanching. After transplanting, water should be given, so as to keep the earth moist, but not saturated, till the plants take fresh root. Afterwards, abundance of water should be given. If manure has not been plentifully supplied, manure-water may be given occasionally; but it should not be strong, otherwise a rank growth is induced, and the flavour of the crop deteriorated. The surface of the ground should be stirred when it is rather dry than moist. The outside leaves possessed by the plant at the time of planting never grow to

a large size; therefore, when more vigorous ones have been produced, these old and comparatively useless leaves may be removed. This should be done before earthing up takes place. When allowed to remain, they generally rot. In order to kill slugs, worms, and other vermin, the surface of the ground should be sprinkled with quicklime, and some finely powdered, mixed with soot, may be occasionally dusted thinly over the foliage. Salt may also be applied in moderate quantities; but it should not come into contact with the plants.

Blanching.—A leaf, or leaf-stalk, grown in the dark is blanched, and the parts so treated are destitute of the green colouring matter, for the production of which light is essential. But the substance as well as the colour of plants grown in the dark is different from that of plants grown in the light. The part of it which we do not grow in the dark cannot be blanched, as it should be, white, crisp, and tender, by any subsequent seclusion from light. This proves that the practice of allowing Celery to grow nearly to its full size and then earthing it is a mistake. A large plant is thus obtained; the outside or oldest leaves are firm, with strong fibres, and are unfit for use, except in cooking, for the longer the plant grows in the light the stronger its flavour becomes.

The plants should be allowed to grow as freely exposed to light as possible for some time after planting. When earthing up is commenced, the soil should not be pressed too closely against the plants, for the heart-leaves must have room to push up; no soil ought to touch them, neither should the outside stalks be made to surround them closely till the final earthing up. As the plants advance in growth, the earthing up must be repeated at intervals of about ten days, or according as the weather proves favourable for the operation, which should not be performed when the leaves are wet, and the drier the soil the better. Some tie up the leaf-stalks loosely with matting, and then earth up. The best method is to gather the stalks together with both hands, hold them with one hand, and with the other bring as much loosened soil against one side of the plant as may be necessary, then, changing hands, bring up the soil on the opposite side. The heart is thus kept clear of soil. Until the last earthing up, at least, the soil should not be put higher than the tops of the set of leaves next to the outside ones. The leaflets will thus be left exposed to enable them to carry on their functions, and contribute to the growth of the stem and roots. At the final

earthing up the soil ought to be put so that the tops are left above-ground.

These directions are for the trench system; but the earthing up of Celery in beds should be on the same principles. The soil is best put to the plants by hand; but it has to be thrown in between the rows from the intervals between the beds, and, unless this is done with care, the soil will get into the hearts of the plants. It will therefore be advisable to use two boards, about 9 inches wide, and in length equal to the width of the bed. These can be placed between the rows, so as to guard the plants on each side whilst the soil is being thrown in between. When a sufficient quantity is introduced, the boards are taken up and placed between the next two rows, and so on.

Celery may be blanched by means of sea-sand. Thus treated, it is clean, well blanched, and glossy; and when canker and other enemies attack the plant, sea-sand may be advantageously employed; or, if it cannot be had, clean river-sand, or pure pit-sand of any kind, free from oxide of iron, watered with a solution of salt, may be employed instead. In this case the sand should be turned whilst it is watered, in order that the salt may be equally diffused throughout. In applying the sand, boards, or the sheet-iron plates, will be very convenient; they can be placed on each side of the row at a little distance from the plants, and the sand can then be introduced between the plants and the boards or plates, which can be backed up with soil to support the sand when they are withdrawn. Sifted coal-ashes are sometimes used for blanching, but they frequently contain substances injurious to vegetation; fine soft ballast or charred soil is preferable.

The French sometimes blanch by tying up the stalks, first near the base, next about the middle, and finally near the top. The whole is then closely covered with dry straw up to the top of the leaves. By this mode Celery blanches, it is said, quickly and well. Semicircular drain-tiles, placed one on each side of the plant so as to inclose it, have been tried, but not very successfully. If the whole plant is not covered, in at top as well as at the sides, the blanching will be imperfect; if it be completely covered, then the leaves previously healthy in the light will become languid in the dark, and will fail to supply elaborated sap, and a good heart for blanching cannot be produced. The power to do this must be derived from healthy, unblanched foliage.

Planting on Raised Beds.—Very fine exhibition

Celery is obtained either by planting on the level or on raised beds. Trenches are naturally considerably cooler than soil on the ordinary garden level, while raised beds derive the full benefit of both sunshine and atmosphere. If, therefore, the Celery is supplied with all it requires in the way of food and moisture at the roots, coupled with a considerable increase of warmth and aeration, it is bound to grow to a greater size and more rapidly than it does in trenches. It would not pay to grow Celery for ordinary use on or above the ground-level, owing to the extra amount of trouble that must be expended in effecting a perfect blanch of the stalks. The exhibitor begrudges no time or labour if only he can win prizes, and his few dozen plants, grown under extraordinary conditions, usually more than compensate for the pains taken with them.

When the plants are put out solid manure ought to be freely dug in and the soil got into a finely divided state, leaf-soil, burnt soil, and fine mortar rubbish benefiting the heavier ground. Those who adopt the plan of growing exhibition Celery on raised beds enclose a square plot of ground with stout boards, supported by stakes driven into the ground. The best of the top soil is then thrown out, and good rotten manure very liberally forked into the subsoil. When the top soil is returned, with it is mixed an equal quantity of fresh loam, with ashes from a garden smother or slow fire, leaf-soil, and well-decayed manure freely added, a light sprinkling of salt also acting beneficially. When well mixed this forms a compost that Celery quickly takes to.

In order to have well-blanched Celery in the first fortnight in August, the plants must be raised in February and kept under glass, growing strongly till near the middle of May. They will experience the least check if moved from the boxes in which they were first pricked out into 6-inch pots—one in each. They ought to be kept near the glass, a shelf in a warm greenhouse suiting them after they are established in pots, and never be allowed to become dry at the root, or become badly root-bound. Plant out on the square, and about 18 inches apart each way. When growing on either raised beds or on the ground-level, an extra allowance of water must be given, liquid manure also promoting vigorous growth, and a mulch of short manure ought to be given early in the summer. Obviously moulding up such tall Celery as can be grown in the manner just indicated is out of the question, nor is it necessary

or desirable, blanching being far more easily effected by means of paper bandages, supplemented by canvas wrapping in the case of any Celery to be kept till November. Commence to bandage up rather early, taking care, however, not to unduly confine the leaves or hearts at the outset. Allow at least one month to elapse between the time of the last heavy bandaging with brown paper and the date of the first show, and the leaves must be partially enclosed, otherwise too much light will penetrate to the stalks. Continue to keep the roots well supplied with water and liquid manure after bandaging the plants, or premature bolting may defeat the efforts of the cultivator. Grove White is one of the best for early blanching, and one of the tall-growing pink- or red-stemmed varieties—Standard Bearer for instance—should be chosen for successional supplies.

Protection.—Although Celery is hardy in its natural state, yet under artificial treatment it is apt to perish in winter. At that season its oldest leaves, like those of other herbaceous plants, naturally begin to decay, and the central portion, though young, is unfitted for resisting frost, in consequence of its having been blanched. The alternate action of frost and wet soon causes it to rot, and frequently wet alone has this effect. Melting snow and hail, descending to the centre, check the growth, and cause it to rot.

In the usual way the stalks are kept upright, so that water from snow melting on the top readily passes down amongst them; but by bending the tops towards one side at the last earthing up, or even commencing to do so at the previous earthing, the rain or snow water would not have a direct downward course. Tough dry turf, or some substance that would not wash down into the hearts of the plants, might be laid on the upper side of the bent Celery tops. Various other means of protection could easily be devised. Thatched hurdles afford good protection, as also do boards nailed together Λ -shaped fashion, and placed over the rows. Some growers use leaves which have been previously heated, and remain in flakes of some 6 inches in thickness, and which resist alike the action of frost and moisture. This covering is removed in favourable weather, and the plants exposed to air, as they should be in all cases. Dry fern, long litter, or any other substance that will form a light covering and resist frost, may likewise be used. Some plants may also be taken up and buried in sand or

light soil, under shelter, leaving, however, the tops of the leaves uncovered.

To save Seeds.—Select some of the finest plants, mark them in order to give them but very little earthing up, and protect them in severe weather. Early in spring they should be carefully taken up and planted in a sunny situation. They should be well-watered, and the flower-stems supported by stakes. The seeds ripen in autumn, and keep good for three or four years; but the newest seeds are the best.

Celery is liable to canker in some soils, particularly in such as contain much oxide of iron. A parasitic fungus also grows upon the leaves.

Insects, &c.—See chapter on this subject.

Leaf Enemies—Celery Fly. *Stem Borers*—Celery-stem Fly.

Carter's Crimson (Hood's Dwarf Red).—Dwarf, of compact habit; hearts very solid, blanching for about 12 inches; the stalks thick, fleshy, and of fine quality.

Dixon's Mammoth White.—Of compact robust habit, about 2 feet high; leaflets broad; hearts very large, blanching about 12 inches, somewhat soft, but of excellent flavour; stands the winter well.

Dwarf Solid White (Incomparable Sandringham) (fig. 1184).—Dwarf and compact; leaflets small, pale-green; hearts solid, pure white, blanching about 10 inches; the



Fig. 1184.—Celery—Dwarf Solid White.

stalks broad, thick, fleshy, crisp, and of fine quality. One of the best, as it blanches readily, is early, and stands the winter well.

Golden Yellow.—A form of Dwarf Solid White, remarkable for the yellow colour of its leaves and stalks, which do not require to be buried to blanch, although they are tenderer and sweeter when earthed up in the usual way.

Ivery's Nonsuch (London Market Red).—Strong, vigorous, about 3 feet high, and with an average girth of 12 inches; hearts very solid, blanching for about 12 inches; the stalks broad, thick, and crisp, with a nutty flavour. Stands the winter well.

Major Clarke's Red.—Very compact, erect, and even,

about 3 feet high; leaflets rather small; hearts very solid, blanching well for about 12 inches; the stalks broad, thick, crisp, with a nutty flavour. One of the best for autumn and summer use.

Manchester Red (Giant Red).—Strong and vigorous, about 3 feet high and 12 inches in girth; leaflets broad;



Fig. 1185.—Soup Celery.

hearts very solid, blanching for about 12 inches; the stalks broad, thick, and fleshy. Excellent in quality; stands the winter well.

Solid White (Danesbury).—Of close habit, 2 feet high; leaflets broad, deeply toothed or serrated; hearts firm and solid, blanching for about 12 inches; the stalks broad, thick, crisp, and tender.

Soup Celery (fig. 1185).—A form in which the leaf-stalks are no longer than in the wild plant. It is quite hardy, and as it suckers freely it may be cut over and will grow again. Its value is for flavouring soups, &c.

Standard Bearer.—A sturdy and hardy form of Major Clarke's Red, and should be grown in preference to it in cold localities.

Wright's Giant Grove.—Habit spreading; hearts solid, blanching to nearly 14 inches; the stalks broad, thick, and fleshy. One of the largest whites, apt to become pithy if very strongly grown.

CELERIAC.—The Turnip-rooted or Knob Celery (fig. 1186) is a variety, the stem of which forms, under favourable circumstances, an irregular knob, and this is the part chiefly used, either sliced as an ingredient in salads, or cooked. It is not so delicate to eat as the other kinds of Celery, yet it is much esteemed on the Continent, especially where the frost is usually so intense as to render it impossible to preserve the other kinds fresh during winter; in this case Celeriac becomes a valuable substitute, as its roots can be taken up and stored out of the reach of frost. On the Continent the roots are grown to the weight of from 3 to 4 lbs.

Culture.—The seeds should be sown early in March, and for succession in April, in a slight

heat under glass, or under a hand-glass on a warm border, and afterwards pricked out as for true Celery. In the beginning or middle of June the plants should be planted out on the level ground in moderately rich and rather sandy soil, in rows 18 inches apart, and at 1 foot from each other in the rows. Before planting, all lateral shoots and some of the outside leaves, likewise the lateral fibres on the root, must be removed. The plants ought to be planted shallow, the roots scarcely so deep in the ground as they had formerly been. Abundance of water should be supplied. Occasionally a little of the soil must be taken from around the bulb, and all lateral fibres removed. When nearly full-grown the bulb should be covered with a little soil to render it whiter than it otherwise would be. The roots will be fit for use in September or October; and before winter, part of the crop may be taken up, divested of all the foliage except the heart-leaves, and placed amongst sand in a shed or cellar. The



Fig. 1186.—Turnip-rooted or Knob Celery.

roots left in the ground will only require protection in very severe weather.

Chamomile (*Anthemis nobilis*).—A hardy native perennial, the flowers of which have long been used as a stimulating tonic. A strong infusion of them also acts as an emetic when taken warm.

There are single and double-flowered varieties, the latter being preferred on account of the greater bulk of its flowers. Chamomile prefers a dry soil, and though it may be raised from seed sown early in spring, is usually propagated by dividing the roots in March or in autumn, or

by offsets. The divisions should be planted in small patches, 9 inches apart, and water should be given at planting, and subsequently till they take root; after that they soon spread and cover the ground. The flowers ought to be gathered when just opened, and successively as they are produced; and after having been gradually and thoroughly dried, they may be stored like other herbs.

Chervil (*Anthriscus Cerefolium*) (fig. 1187).—An annual, native of the south of Europe, cultivated for the leaves, which when young are used in salads and to flavour soups.

The seeds may be sown either broadcast and lightly raked in, or in shallow drills, 8 inches apart, covering very lightly with mould. The first sowing must be made in October for spring use; and if a constant succession of tender leaves is required, successional sowings should be made every month from the end of February till September. In summer, it should be sown in a shady situation, and a warm position should be be chosen when the weather is cooler, and when



Fig. 1187.—Chervil (*Anthriscus Cerefolium*).

consequently the plants are not so apt to run to seed.

BULBOUS-ROOTED CHERVIL (fig. 1188) (*Chærophyltum bulbosum*).—A hardy biennial, a native of South Europe, producing fusiform roots somewhat resembling a small Parsnip, or about the size of an Early Horn Carrot; flesh yellowish white, farinaceous, rather sweet, with the flavour of Chervil. They are eaten boiled, and are said to be more farinaceous than the Potato, resembling more the Chestnut.

The seeds should be sown broadcast or in drills, in any good garden soil, in August, September, and October, but if later than this the plants will not come up till the second year. As the seeds often perish in the ground in

winter, it is a good plan to stratify them soon after they are gathered. This operation consists in putting a layer of fine sand in a large flower-

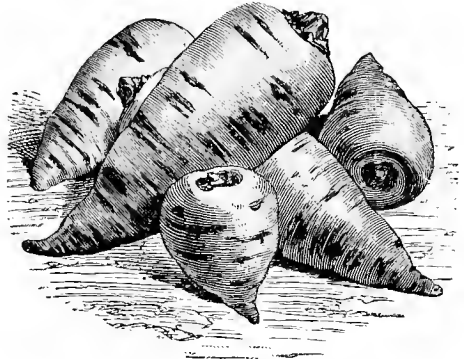


Fig. 1188.—Bulbous-rooted Chervil (*Chærophyltum bulbosum*).

pot, then a layer of seeds, then one of sand, and so on alternately till the pot is full. It may then be plunged in any spare corner, and protected from frost; and it may thus remain till February or March, when it may be sown where intended to remain to produce the crop, covering the seeds lightly with fine soil. The roots will be ready to take up in July, when the leaves become withered. They should be kept, like Potatoes, in a dry dark place. The produce is from 60 to 70 lbs. per square pole or perch, or a dish from about a square yard. It is therefore worthy of trial as a rarity, and it is doubtless capable of improvement.

Chicory (*Cichorium Intybus*, fig. 1189).—A hardy native perennial, growing by roadsides and in waste places, particularly in calcareous soils.

In the garden it is only grown as a salad plant, and as such it is not so generally cultivated as it deserves. The leaves, when cut quite young, constitute a rather bitter but very wholesome small salad, much esteemed in Paris, but not much used in this country. When blanched, the leaves furnish the excellent winter salad known by the name of *barbe de capucin*. The large fleshy roots are cultivated on an extensive scale for mixture with coffee, on the inferior sorts of which its addition effects a decided improvement. For this purpose the fresh roots are cut into small pieces, dried on a kiln, roasted, and ground. The leaves are also an excellent fodder, and are greedily eaten by cattle of all kinds.

Under the name of Witloof, literally white leaf, a peculiar variety of Chicory has been much cultivated in Belgium as a salad plant,

and is preferred in a blanched state to the Barbe de Capucin and other Chicories grown in France. The part used is the tuft of young radical leaves represented on fig. 1189, and this is either eaten raw as a salad, or cooked whole and served with white or cream sauce. Grown



Fig. 1189.—Chicory (*Cichorium Intybus*).

and blanched under similar conditions, it is, however, of doubtful superiority to the improved Chicory.

If Chicory is grown as a small salad, it may be had all the year round by sowing every fortnight or three weeks in the open ground, or on a hot-bed, according to the time of the year. In general, however, sowings in the open ground from the end of April to the end of October will be sufficient, as the blanched leaves are used during the interval. When grown for this purpose, the seed should be thickly sown broadcast; and in summer a cool shady situation should be chosen. Watering is all that is required till the plants are fit for cutting over, which should be done as soon as they have made the first three or four leaves.

Cultivation for Blanching.—In order to obtain the blanched leaves of Chicory, several modes of cultivation have been recommended.

The late Mr. Fleming of Trentham recommended the following:—

An open border should be chosen for Chicory, and as it produces long Carrot-shaped roots, the soil should be deep, rather light, and moderately rich. Fresh manure should not be applied unless the ground is very poor; and when it is really necessary, guano will be found preferable to that from the stable. If guano is used, it should be sown broadcast over the beds as soon as the plants are fairly up. The ground should be double dug and well pulverized to the full depth, in order that the long tap-roots may meet with no impediment in their downward progress. About the middle or end of June, the seed should be sown in drills, 16 inches asunder. If the seed seems good it should not be sown too thickly, for the plants must be thinned out to the distance of 8 inches from plant to plant. This is a much better method than sowing in a bed and afterwards transplanting, as they are liable to lose their tap-roots during the operation, to obviate which is an essential point in their successful cultivation. As snails are particularly fond of Chicory, especially when the plants are young, it will be advisable to sprinkle a little quicklime over the beds as soon as the plants are above ground. Nothing more is necessary, except to fork between the rows before the leaves cover the ground, and afterwards to keep the beds free from weeds.

By the end of November the larger leaves will have decayed, leaving only a few small ones in the hearts of the plants. At this time they should be taken up and neatly laid in at the back of a north wall, to prevent the undue excitement occasioned by warm weather. Care should be taken to injure the roots as little as possible during this operation.

A fortnight before the blanched leaves are required for use, a sufficient quantity should be removed into a spare corner of the Mushroom-house, or some similar place, where they can have a little heat. They should be planted in old tan, sand, or some other light material which contains just sufficient moisture to set the fibres in motion. In planting, the crowns should stand at least $\frac{1}{2}$ inch above the surface, and any loose soil should be removed from about the leaves with a syringe, in order that the young foliage may be perfectly clean when cut. In about ten days the leaves will have made a vigorous growth of as many inches, and if they have grown in perfect darkness the colour will be a delicate creamy white. When the leaves are about a foot high they will be ready for use, and as soon as they are cut the

roots should be removed and others brought forward to succeed them.

After the earlier forced roots are removed they may be returned to the north border, and have a little old tan strewed over their crowns. Here their strength will in some measure be recruited, and they will bear forcing a second time, and will produce a second crop of leaves towards the middle or end of March. These leaves will be produced from the lateral buds around the base of the crown, if in the first cutting it has not been pared too close; they will scarcely be so fine as the first crop, but will prove very useful late in the season, if the supply of roots is limited.

An easy, and at the same time an effectual, method of blanching Chicory leaves in a comparatively light house, is to have a few wooden boxes constructed, about 12 or 14 inches deep, and to invert these over the plants. Each box should be large enough to cover a sufficient number to supply a respectable salad for a week, which will vary from one to three dozen, according to the requirements of the family. By proper attention to removing the old roots in rotation, and substituting fresh ones in their places, a supply of excellent salad may be obtained from a space large enough to hold three of these boxes.

Any one who possesses a garden in which to grow the plants in summer, may blanch them in a cellar with equal facility, if it is kept sufficiently dark, except that it will require three weeks to produce leaves of the requisite length. If the cellar is used for this purpose, it will be the readiest way to form a stack in one corner, and lay the roots horizontally in sand as you would to preserve Carrots. The roots should not be all put in at once, but a layer or course of roots should be brought in once a week, and by the time the fourth course is in the first will be ready to cut. Under this system the old roots should not be removed, but retained to produce a second cutting; and by taking advantage of this property it will not be necessary after the first four or five weeks to bring in a fresh supply of roots oftener than once every fortnight or three weeks. The roots should be laid about 3 inches apart in layers of sandy soil. This is a cheap method of procuring a first-rate winter salad.

As Chicory commences its growth very early, the blanched leaves may be obtained out-of-doors in February and March, by planting the roots in a moderately dry border, and inverting a close box over them, in the same manner as

directed for growing them in the Mushroom-house. By this method a somewhat longer time will be necessary to produce leaves of the requisite lengths, for which reason it will only be resorted to when other means are not convenient.

The French, who excel in the production of Chicory, adopt the following modes of treatment:—

The seeds are sown thinly in April or May. In November or December beds of light sandy soil, or well-decomposed dung, about 2 feet in width and 3 inches thick, are formed in a cellar. On these is placed a row of Chicory roots laid on their side, with the crowns outwards; next comes another layer of earth of the same thickness as before; then another row of roots; and so on. The mild and equable temperature of the cellar, and the want of light, soon occasion the production of blanched leaves, which are cut as soon as they have attained a sufficient size. Water must be given as required if the soil used is too dry.

Near Paris a more expeditious method is pursued; beds of hot dung are made up, and the roots of Chicory, tied up in bundles, are placed in an upright position upon the beds, and watered from time to time so as to keep them moist. Another method of blanching without taking up the roots consists in sowing in drills from 6 to 8 inches asunder, and covering

the Chicory in February with 4 or 5 inches thick of earth, or with double that thickness of leaves. In three weeks or a month afterwards, according to the season, it pushes, and as soon as it appears above the additional soil or leaves it is cut over by the original level of the ground. Thus treated the leaves are very white and tender.

In order to save seeds, a few plants may be left through the winter. They will flower in July and August, and ripen their seeds in autumn.

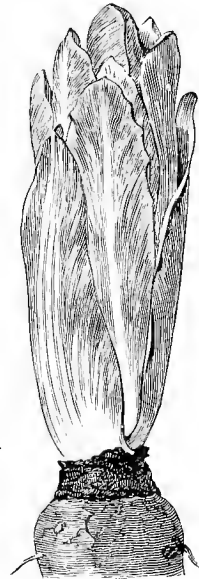


Fig. 1190.—Witloof Chicory.

The varieties grown in France are: Coffee Chicory (*Chicorée à café*), Improved Chicory (*Chicorée sauvage améliorée*), and Variegated Chicory (*Chicorée sauvage améliorée panachée*).

The varieties generally grown are:—

Large Brussels (Witloof) (fig. 1190).—This has large leaves with wide midribs and stalks. When blanched it is not unlike a Cos Lettuce in appearance. It is eaten raw as a salad, and also boiled like Endive.

Large-rooted.—Grown chiefly for its Carrot-like roots, which are employed in the manufacture of Coffee Chicory.

Red Italian.—Remarkable for the rich-red colour on the blanched leaves, which makes it a favourite to mix with salad.

Chinese Artichokes, *Crosnes du Japon*, *Spirals* (*Stachys tuberifera*) (fig. 1191).—A hardy tuberous-rooted perennial, and a welcome addition to winter vegetables. The

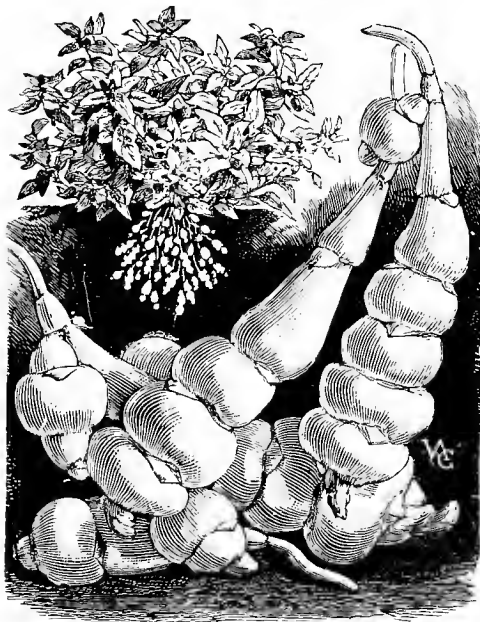


Fig. 1191.—Chinese Artichoke (*Stachys tuberifera*).

plant grows from 10 inches to 15 inches in height, with a branching head. The principal root, or what may be termed the underground portion of the stem, forms numerous fibrous roots, to which are attached spiral tubers, pearly-white in colour, 2 inches or rather more in length and about half an inch in thickness, both ends being tapering. They are cooked either by roasting, boiling, or steaming, and served with melted butter and other sauces form an excellent dish. Though most appreciated in a cooked state, they are yet sometimes eaten raw, and are not unlike a mild Radish in flavour, with just enough of the taste of a Jerusalem Artichoke to have suggested the name of Chinese Artichoke for them. They are quite hardy and of the easiest possible culture, in fact there is a possibility of their becoming

a troublesome weed wherever the crops are not lifted. At the same time a certain amount of pains ought to be taken with them, or otherwise the tubers may prove too small to be serviceable.

A moderately rich, free, working soil is desirable, and in this drills may be drawn 18 inches apart, and strong whole tubers be planted from 9 inches to 12 inches apart, in fine soil. In cold, low-lying positions raised beds 4 feet wide should be formed to hold three rows. The best crops of well-formed tubers are had from ground in a finely-divided state, which offers no obstructions to the free growth of the tubers. All that is further needed is to keep the surface of the ground loosened and free of weeds. It will be found that the tubers keep fresher in colour and more tender in the ground where grown, digging them as required for use, but they ought all to be lifted before active growth commences in the spring, this also being the best time to replant. Those who prefer lifting the crops when the tops die down ought not to expose the tubers longer than necessary, as this discolours them, and they must also mix them with moist sand or fine soil, or otherwise shrivelling and decay quickly takes place.

Chives (*Allium Schoenoprasum*).—A hardy native perennial, cultivated for its leaves, which are used in salads and soups instead of young Onions.

It will grow well in almost any soil, and is propagated by dividing the roots in spring or autumn, and planting them in small patches, 6 inches apart, in rows from 9 to 12 inches asunder. The plants soon form large bunches of leaves, which become the more tender the more frequently they are cut. Chives will grow in the same spot for four or five years, after which the plants must be taken up, divided, and replanted in fresh soil. The ground between the rows should be hoed occasionally. Some cut the plants down in autumn, and after leaving them for some time to dry, cover them with an inch or two of mould.

Chou de Burghley, or **Cabbage Broccoli**.—This is said to have been originated at Burghley, by crossing a Cabbage with a Broccoli. It can be used as a Cabbage in the autumn or early part of the winter, or kept till the spring, when those that survive will be found to have a Broccoli-like heart. Isolated plants that exactly agree with these particulars

can, nearly every season, be found among breadths of Snow's Winter White and other Broccoli, and if seed is saved from any of these a form of Cabbage-Broccoli will result.

When first sent out, very many cultivators erred in growing it too strongly. The seed was sown either in gentle heat in February or March, or else in the open in the latter month, and being duly prepared and got out early on rich ground, the plants grew to a great size and produced immense solid, conical hearts, ready for use in the autumn, but which no good cook would look at. When, however, neater hearts are forthcoming in quantity late in the autumn and during the winter months, for this Cabbage when fully grown will withstand frosts well, the case is very different, the delicate flavour of the well-blanchd yet not too solid hearts finding favour with most people.

The seeds should be sown in the open during the first week in April, and again near the end of that month. Draw drills 4 inches apart, give a gentle watering if at all dry, sow the seeds thinly and cover with fine soil. Thin out lightly wherever there are patches of plants, and when about 5 inches high transplant into firm, moderately rich ground 18 inches asunder, in rows 2 feet apart. During dry weather, or till such times as the plants are well established in their fresh quarters, give occasional waterings, and draw a little soil up to their stems before the plants cover much of the ground. In this manner an excellent supply of neat, conical, blanchd hearts is obtained during December, January, and February, when other Cabbages are usually scarce.

Clary (*Salvia Sclarea*).—A biennial, native of South Europe. The leaves are used in soups. The seeds are sown in April, in drills 18 inches apart, and when the young plants are 3 inches high they are thinned out to 1 foot apart in the row. The subsequent culture is confined to keeping the ground clean, and stirring it by an occasional hoeing. The leaves may be gathered and stored for use till the following summer. The plants flower in August, and die off soon after the seed is ripe.

Coriander (*Coriandrum sativum*).—An annual, native of South Europe, and said to be wild in some parts of England.

Its young leaves are put into soups and salads, and the seeds are extensively employed in confectionery, for disguising the taste of medicines, and by distillers; they are also used in soups and some other made dishes.

Corn Salad, or Lamb's Lettuce (*Valerianella*).—Much esteemed in France as a small salad, and as a substitute for Lettuce during the winter and spring.

Two species, both annuals, are cultivated, viz. *V. olitoria* (Common and Round) and *V. eriocarpa* (Italian) (fig. 1192). The whole plant is used



Fig. 1192.—Italian Corn Salad (*Valerianella eriocarpa*).

as a salad, and is much grown for that purpose in continental countries.

Corn Salad is raised from seeds, which should be sown on a bed or border of light rich earth, manured the preceding year. It may either be sown broadcast, and lightly raked in, or in shallow drills 5 and 6 inches asunder. All the culture required is confined to watering the seed-bed and young plants in dry weather, and to protecting them with long litter during severe frost. The plants will be sufficiently thinned by removing the most advanced for consumption, leaving the youngest to come in for use in succession.

The first sowing may be made in the beginning or middle of August, and from that time till the end of October a small quantity may be sown every week or fortnight, according to the demand. These sowings will afford a supply for autumn, winter, and early spring use. If required in the latter part of the spring, and in summer, it may be sown monthly from the beginning of March till the end of July. Seeds are saved by allowing some of the plants to run, and, as they are easily shed, they must be gathered as they ripen by spreading a cloth under the plants, which are then shaken. This having been repeated on several occasions, as the seeds successively ripen, the plants are finally pulled up and hung in a shed to ripen the remainder. The seeds remain good for six or eight years.

Cress, American (*Barbarea præcox*).—The American or Belle-isle Cress is a native perennial, growing naturally by the sides of brooks. The leaves are used for the same purposes as those of the common Cress. It prefers a light and somewhat moist soil. It is raised from seeds, which should be sown thinly in shallow drills 9 inches asunder, thinning out the young plants to 4 inches apart in the row. A sowing for winter and spring use may be made in the beginning of September. To have tender leaves in winter, some plants of this sowing should be transplanted to 3 or 4 inches apart, so that they may be covered by hand-glasses in severe weather, or they may be protected by spray covered with dry litter. If required in summer, seeds may be sown in a warm situation in March, and again in May and July; but if in constant demand, they should be sown monthly from March till September. All the culture required is to water occasionally in dry weather. In gathering, the plants may either be cut over, but not too close to the ground, or the leaves may be gathered singly; in either case fresh leaves for another gathering will be produced.

Cress, Garden (*Lepidium sativum*).—A hardy annual, native of Persia. It has been cultivated in this country since 1548.

For a succession, sowings may be made in an open border in March, April, and May, choosing a shady situation for the May sowing.

The varieties are:—

Broad-leaved Cress.—A coarse sort, seldom grown, except for feeding poultry.

Common Cress.—The sort most generally grown. It is sown and treated in the same way as Mustard.

Curled or Normandy Cress.—This is a very hardy and excellent sort of Cress. The leaves, being finely cut, also make a good garnish.

Golden or Australian Cress.—Dwarf, yellowish-green, slower in growth than the preceding, and of a mild flavour. Sow thinly from March to August, and in September and October for winter and spring use. For sowings in the latter two months a sheltered situation should be chosen.

Cress, Water (*Nasturtium officinale*).—A hardy native perennial, found growing in ditches and small streams. It is considered to possess antiscorbutic properties; it is also said to contain iodine, to which probably some of its virtues may be attributable. It is extensively cultivated for the London market. At Erfurt, and in the neighbourhood of Paris, large quantities are also grown. It is propagated by seeds; but, in forming plantations, seedlings from the

natural habitat of the plant, or rooted divisions, are usually employed.

There are three sorts, namely *Green-leaved*, *Small Brown-leaved*, and *Large Brown-leaved*. The Green-leaved is the easiest of cultivation, and the Small Brown-leaved is the hardest, whilst the Large Brown-leaved—which, on account of its appearance, and probably also from its having a less proportion of stalk to the leaf, is preferred in the market—is the only one which can be well grown in situations where shallow water is not to be obtained. At Northfleet, Springhead, the plants grew better, and had a superior flavour, when disposed in rows parallel with the course of the stream, than when left in irregular patches. When in rows the plants are more regularly exposed to the influence of the current, and the water is not so much impeded in its course, because there are regular open channels between the rows. It is also more easily gathered from the rows, and more readily freed from weeds and the different matters which pass down the stream and become entangled with the plants. It was found necessary to vary the spaces between the rows according to the depth of the water. When it is deep the rows are 5, 6, and even 7 feet apart, whilst in shallow waters about 18 inches between the rows is considered as sufficient. The plants are found to thrive best in shallow water, that is, when the depth is about $1\frac{1}{2}$ inch, which increases to about 3 inches when the plants begin to grow, and thereby to check the current. In deep water the roots are easily drawn out of the soil, which makes it difficult to gather the vegetable freed from the roots; if, therefore, a sufficient space covered with shallow water could be obtained the deep water would not in any case be used.

The shoots are cut for market, not broken off, which is the usual mode of gathering the wild Cress, and is very injurious to the plants in the beds. After frequent cuttings the heads are found to grow small.

The most expensive part of the cultivation is the necessity of clearing out and replanting the beds twice a year; as the mud quickly collects about the roots, and the duck-weed and other plants become intermixed with and choke up the Cress, it is almost impossible to pick it in a fit state for market after the plantation has been made five or six months.

The mode of replanting is to remove all the rows of plants, beginning at the stream-head, and then clear the bed of the stream from mud and rubbish; which, however, it should be re-

AUBERGINES

Aubergines are the fruits of *Solanum Melongena*, the Egg-plant or Brinjal, an annual, cultivated in the warmer regions of the globe before the Middle Ages, but supposed to have had its origin in India or Arabia. Modern travellers have found it cultivated in the Nile Valley and on the coast of Guinea. The fruits are highly esteemed in many countries, but they have only recently found favour in the British Islands for table use. They are eaten either raw or cooked, in the same way as Tomatoes. There are many varieties, their colour ranging from white to black-purple, whilst in shape and size they also vary considerably, the largest being from six to eight inches long and two to three inches in diameter. One called *ovigerum* has fruits exactly the same shape and colour as a hen's egg; its fruits are not fit to eat, but it is often grown in England as a decorative plant.



AUBERGINE OR EGG FRUITS (7 VARIETIES)

(F. 100.10)

marked, make excellent garden-manure. From the mass of plants thus taken out, the youngest and those with most roots are selected; these are placed on the gravel in rows, at the requisite distances, with a stone on each plant to keep it in its place.

The Cress will not grow freely in a muddy bottom, nor will it taste well when there is mud about the roots, which should be carefully removed and replaced by gravel or chalk. It is absolutely necessary to have a constant current, as, when there is any obstruction to the stream or flow of water, the plants cease to thrive. The times of renewing the beds are May and June, and from September to November. The planting is done in succession, so that the crops may come regularly into cutting. Those planted in May are fit to cut in August, and those planted in November are ready to gather in the spring.

After the plants have been cut about three times they begin to stock, and then the oftener they are cut the better. In summer it is necessary to keep them very closely cut; and in water of a proper depth, and with a good soil, each bed supplies a gathering once a week. In winter the water should be rather deeper than in summer (4 or 5 inches); to obtain this the plants are left with more head, that the water may thus be impeded.

It is essential that the plantations should be made in fresh or newly risen spring-water, as the plants not only thrive better in it, but, in consequence of its being rarely frozen, they generally continue in vegetation, and in a good state for gathering, throughout the winter season.

Water-cress may also be grown in a shady border of rich soil, covered with a thin layer of sand to keep the leaves clean, and kept constantly moist by frequent waterings; but in this way the produce is inferior in quality to that obtained from plants grown in water. It may be also grown in tubs, boxes, and pans partially filled with soil, which is covered with water. The water should be frequently drained off and replaced by fresh.

The cocoons of the Water-cress Fly (*Tipula reptans*), as well as the eggs and larvæ of various other insects, are found on the Water-cress, and sometimes cause much inconvenience when eaten; the leaves should therefore be thoroughly cleaned previous to use. The most effectual mode of doing so consists in steeping the Cress for some minutes in salt water, and then washing well with fresh.

Cucumber. See special chapter, p. 322.

Dandelion (*Taraxacum Dens Leonis*).—This well-known plant, which medicinally is of some importance as an anodyne, aperient, and diuretic, is occasionally blanched and eaten as a salad, both in this country and in France; and as such it is much esteemed by many persons in both countries.

It should be sown in spring, in a rather moist soil, previously well dug; or roots may be planted. In the following spring, as soon as the plants begin to push above ground, they may be covered with a layer of sand 3 or 4 inches in thickness, or flower-pots may be placed over them; but blanching by means of sand is preferable. When the leaves begin to make their appearance above the sand a portion of the plants may be cut over by the ground, and by casting the sand which covered them over the uncut portion, the latter will be covered to a greater depth at each cutting, and will consequently come in for use in succession. It is hardly necessary to observe that the plants should not be allowed to scatter their seeds in summer.

Egg-plants or Aubergines (*Solanum Melongena*) (see Plate).—An annual, cultivated in the warmer regions of the globe before the Middle Ages, but supposed to have had its origin in India or Arabia. Modern travellers have found it cultivated in the Nile Valley and on the coast of Guinea. The fruits are highly esteemed in many countries, but they have only recently found favour in the British Islands for table use. They are eaten either raw or cooked, in the same way as Tomatoes. There are many varieties, their colour ranging from white to black-purple, whilst in shape and size they also vary considerably, the largest being from 6 to 8 inches long, and 2 to 3 inches in diameter. One called *ovigerum* has fruits exactly the same shape and colour as a hen's egg; it is often grown in England as a decorative plant; its fruits are not fit to eat.

In Provence the fruit is cut longitudinally in two, and the seeds and spongy substance surrounding them are taken out. The two halves are then placed on the gridiron, with the cut faces upwards, and whilst roasting the flesh is soaked with fine salad oil or fresh butter, applied a little at a time, a sufficiency of pepper and salt being added. Some augment the flavour with Parsley, Anise, or other aromatic herbs; others place an anchovy or a pilchard between

the two pieces. The great difficulty in cooking is to avoid the flavour of smoke; with this object in view the fruit is sometimes cooked between two plates.

Another mode of preparation consists in peeling the fruit, placing it in a frying-pan, scoring it across and across, filling the incisions with fine Florence oil, and then sprinkling with salt, pepper, nutmeg, and grated bread. When half-cooked a little aromatic vinegar is poured over the fruit, which is then served garnished with Parsley or Chervil.

To ripen the fruit perfectly the seeds should be sown in January or February, in pans of rich soil, placed in a temperature of from 65° to 70°. When the young plants have made two leaves, they may be potted off singly into small pots, from which they should be shifted on till in 8- or 10-inch pots, in which they may be fruited. The plants ought at all times to receive abundance of water, and manure-water may be occasionally given until the fruit has nearly attained its full size, after which the application should be discontinued. The plants ought to be grown with a single stem, which must be pinched to encourage the production of two branches, which should themselves be stopped to make them throw out laterals. When four fruit are set, no more fruit or laterals should be allowed to form, or the fruit will be small.

The Parisian market-gardeners adopt the following mode of cultivation. They sow in December or January. A hot-bed is prepared, the heat of which should be from 68° to 77°. It is surrounded with a good lining, and covered with a layer of vegetable mould about 5 inches in thickness, and when the requisite degree of heat is attained the seeds are sown. The sashes are covered at night with a good straw-mat. A fortnight or three weeks after sowing, a second bed, not so hot as the first, is prepared. This is covered with vegetable mould, and when the seed-leaves are well developed the young plants are pricked out into this second bed, and after some time they are again taken up and replanted in the same bed, but at the distance of 8 or 9 inches from each other. The covering up of the sashes at night is still continued, and as soon as the young plants begin to grow a little air is given if the temperature will permit.

In March another hot-bed is prepared and covered with vegetable mould. When the heat

is from 60° to 68° four egg-plants are planted under each 4½-feet sash. They do not get air for several days, in order that the plants may more readily take fresh root, after which a little air is given by pushing the sashes either up or down, and these are opened wider as the season advances, so that they may be taken off in the month of May. The further attention they require consists in watering when necessary, and in cleaning the leaves, which are often attacked by scale or by red spider. By these means fruit fit for gathering may be obtained about the end of June or beginning of July, and the plants continue to bear good fruits till October.

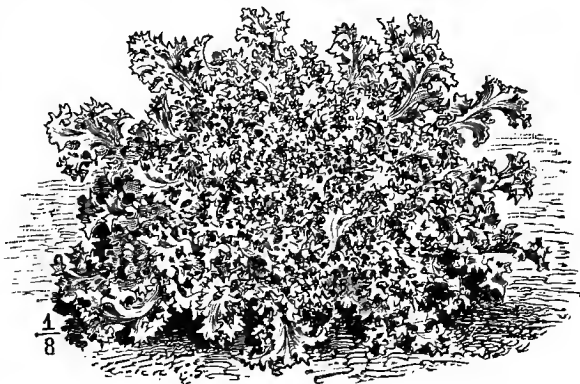


Fig. 1193 — Endive.

Endive (*Cichorium Endivia*) (fig. 1193). A hardy annual, common in the Mediterranean region. It is closely related to the common Chicory. In habit it resembles a Cabbage Lettuce, the leaves spreading in a rosette from a short fleshy stem. It requires less warmth than the Lettuce, and is therefore useful as a salad in late autumn and winter. It also serves as an ingredient in some other culinary preparations.

Cultivation.—A light rich soil is suitable for the growth of Endives, and a position exposed to full sunshine. A small sowing of seeds may be made in May. The first main crop may be sown about the middle of June. The principal crops for winter use require to be sown in the middle and end of July. Lastly, a sowing to come in late may be made in mid-August.

The seeds should be sown thinly, on a bed of rich earth raked fine, in shallow drills 4 inches apart, covering lightly with fine soil. In dry weather the seed-beds should be watered through a fine rose till the plants make their appearance. The plants, as they advance in growth, should be thinned out to 3 or 4 inches apart in the

rows. In dry weather frequent waterings should be given. When the plants have made four leaves they should be carefully taken up and replanted where they are to remain. Plants of the curled-leaved varieties may be planted 1 foot apart each way; but for the Batavian, which generally requires more room, 15 inches by 12 inches may be allowed.

Instead of sowing in seed-beds and transplanting, some sow the seeds where the plants are to remain, and thin out to the proper distances. This answers well for the early crops, or such as have not to be planted on sloping banks, or in frames in winter.

About three months after sowing, or as soon as the plants are nearly full-grown, the leaves should be gathered together, and tied up near the top with matting, and again round the middle about a week afterwards. If water should be necessary after tying, it should only be given at the root of the plant.

Blanching is also effected by placing inverted flower-pots over the plants, covering the hole in the bottom with a piece of slate or tile; by laying a slate, or preferably a flat tile, over the plants; by covering with sand or coal-ashes; or by placing boards on each side of the row, leaning their upper edges against each other, so as to form a roof, and preventing the light from getting in at the ends. A mat laid over the plants also answers tolerably well for the flat-growing kinds. The best methods, however, are tying up, or using a blanching-pot or saucer.

Forcing.—In France this excellent winter salad is regularly forced, under the following treatment:—

The seeds are sown in January and February on a brisk hot-bed covered with vegetable mould, which is afterwards beaten with the back of the spade to give the seed a hold. A fortnight or three weeks after the plants come up they are transplanted in another hot-bed where less heat is maintained. Air is given when the weather is favourable, and the plants, when sufficiently hearted, are tied up as when grown in the open ground. Endives produced in this way are perfectly blanched, of good flavour, and are sold at Paris in the spring.

There is another mode which has been successfully practised of late years, and in which the seeds are sown from the 10th to the 15th of September, in the open ground, under bell-glasses or cloches, or in a cold frame. About three weeks afterwards the young plants are pricked out under other bell-glasses or in cold frames; and in November or December they are planted

close together in frames. The plants must not be exposed to the air, otherwise they toughen; they should therefore be kept rather close; and in frosty weather they must be protected with litter and straw-mats. Endives obtained in this way are very small, but well blanched and very good. The French Small Green Curled is the kind generally employed for forcing.

The time occupied in blanching varies from ten days to three weeks—a longer period being required for completing the process in winter than in summer, when growth is more rapid. A number of plants, sufficient to afford a supply for a week, should be set to blanch at one time, and by doing the same every week, a constant succession will be secured.

Various modes of protecting Endives during the winter are adopted. The market-gardeners near London form sloping banks facing the south and sheltered from the north. On these, in November, Endives are planted 6 or 8 inches apart, and protected with litter in severe weather, but they are left uncovered at all other times. A supply during winter may, however, be more certainly secured by taking up the late-sown crops before frost, and replanting in soil or sand, in a frame or shed, or by placing a frame over them without taking up. These can be blanched by one of the methods already given, or in a Mushroom-house. To keep the plants clean during the process of shifting they should be tied up with matting strips. Blanched Endives soon lose their freshness.

To save Seeds.—Only the finest plants should be selected, preferably autumn-sown that have been protected through the winter and planted out in a warm sheltered situation in March, or plants raised from seed sown early in spring. The flower-stems should be supported, to prevent injury from the wind, and the seeds should be gathered as they ripen. After having been spread upon a cloth to dry, they may be rubbed out and stored. They remain good for five or six years. Plants raised from old seeds are not so apt to run as those from new seeds.

Broad-leaved Batavian (fig. 1194).—Leaves long and broad, the edges somewhat ragged. Commonly cultivated. Requires to be tied up for blanching.

Exquisite Curled.—It would be difficult to convey an idea of the beauty of this elegantly curled Endive. In colour it is midway between the white and green varieties, and in habit it resembles Fine Green Curled. Recommended for forcing.

Fine Green Curled.—The finely-laciniated leaves are highly ornamental, and make a most delicate salad. If sown in a shady position, the plants remain fit for use a long time.

Incomparable Green Curled.—Not so finely curled as some other varieties, but one of the largest, and produces beautiful white crisp hearts. Does not readily run to seed.

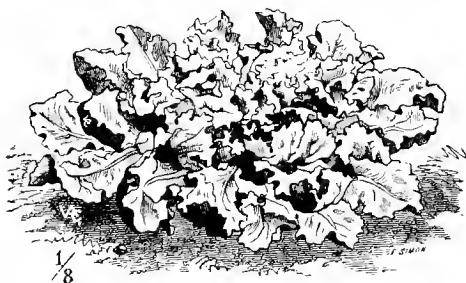


Fig. 1194.—Endive—Broad-leaved Batavian.

Italian Green Curled.—Leaves narrow, divided to the very midrib, segments also much cut and curled; whole plant dark-green. Ties up well.

Large Green Curled.—Leaves longer and rather more upright than those of the Small Green Curled. It ties up well to blanch, is hardy, and is not subject to rot.

Lettuce-leaved Batavian.—Leaves large, obtuse, ragged at the edges, of a pale colour even when young. They require to be tied up for blanching. Should only be cultivated for early use, as it is tender.

Moss.—A small, very finely-cut and curled sort, allied to Stag's-horn.

Small Batavian.—Leaves pale-green, slightly ragged at the edges, forming a good heart; mild and sweet compared with others.

Small Green Curled.—Leaves much cut and curled, lying flat on the ground; heart-leaves full and close. It is slow in hearting, and when sown early is apt to run.

Stag's-horn.—Leaves deep-green, finely cut, but not much curled; heart full, yellow, and tender. One of the principal kinds grown for the Paris markets.

White Curled.—Leaves flat on the ground, with a very open heart, pale-yellowish. Is best when cut very young for salads.

White-flowered Batavian.—Blanches white and tender. Flowers white. Highly deserving of cultivation.

Winter Curled.—A large hardy, curled Endive, admirably adapted for winter use.

Fennel (*Foeniculum vulgare*), a perennial, native of South Europe, naturalized in this country. Its tall, finely-divided, aromatic leaves are used in fish-sauces and for garnishing, the stalks are eaten in salads, and the seeds are employed in confectionery and for flavouring liqueurs.

The two varieties cultivated are the common or Sweet and Finochio Fennel (fig. 1195).

The common Fennel may be propagated by sowing the seeds in February, March, or April, on a light warm soil, in shallow drills 15 inches apart, thinning out the young plants to 1 foot apart; or the seeds may be sown in a bed, and the seedlings planted out when 3 or 4 inches high. With the ordinary culture of keeping the ground free of weeds, and stirring it occasion-

ally, a plantation will last several years. If seeds are not to be saved, the plants should be topped, with the view of encouraging a growth of young and tender leaves, and to prevent the production of seeds, which, if allowed to ripen, would scatter, and seedlings would spring up in all directions.

Finochio Fennel is seldom grown in this country, but in Italy it is much cultivated for its swollen leaf-stalks, which are shorter and rounder than in Celery, and which are blanched and eaten raw with pepper and salt; or boiled with fowl, meat, Parmesan cheese, or macaroni. Finochio requires a rich soil, and should be sown in drills 1 foot apart, thinning out, when the young plants are well established, to 8 inches in the row. The ground should be stirred and frequently watered, in order that they may grow rapidly; they should be earthed up about three weeks before they are to be used.

A sowing should be made about the middle or end of March, according to the season; and monthly from that time till the end of July or

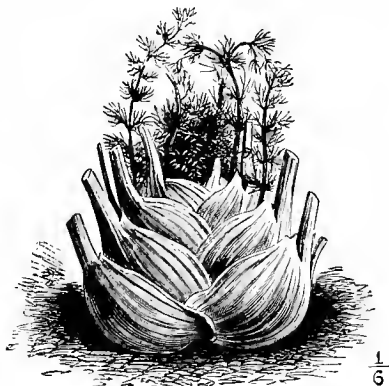


Fig. 1195.—Finochio Fennel.

beginning of August, if a constant succession is required. The plants from the first sowing will be fit for use in July, and the others will come in for use in succession till December. At the approach of frost, the plants should be protected with fern or litter.

Garlic (*Allium sativum*). A hardy perennial, native of South Europe. It is cultivated for its bulbs (fig. 1196), which are used in soups, stews, and other ways; but not so much in Britain as in Italy, Spain, Germany, and the south of France—its strong flavour, and the offensive smell which it communicates to the breath, causing it to be sparingly used in our cookery.

Garlic succeeds best in a light, rich, and rather dry soil, and a warm situation. It is propagated

by bulblets, planted in February or March, 6 inches apart, in shallow drills 1 foot asunder, and covered to the depth of 2 inches.

A small quantity may also be planted in October or November, to come in earlier than the spring planting. All the culture necessary is



Fig. 1196.—Garlic.

confined to keeping the ground free of weeds. When the leaves turn yellow, the plants may be taken up, dried in the sun, and then tied in bunches by the stalks, and hung in a dry airy room. Some bulbs from the autumn planting may be taken up in May or June for immediate use.

Good King Henry (*Chenopodium Bonus Henricus*). A perennial, native of Europe, including Britain.

"We think it an excellent vegetable for England, and deserving to be more generally planted. It is extensively grown by the Lincolnshire farmers, almost every garden having its bed, which, if placed in a warm corner and well manured, yields an abundant supply of delicious shoots a fortnight before Asparagus comes in, and for some weeks afterwards. From a south border, cutting generally commences early in April, and continues till the end of June. Some say they like it better than Asparagus.

"When properly grown, the young shoots should be almost as thick as the little finger, and in gathering it should be cut under the ground, something the same as Asparagus. In preparing it for use, if the outer skin or bark has become tough, strip it off from the bottom upwards, and then wash and tie it up in bunches like Asparagus. It is best boiled in plenty of water. When tender, strain and serve simply, or upon toast. Some have melted butter with it, others eat it simply with gravy and meat." (*The Garden.*)

Cultivation.—Sow the seeds in spring in a seed-bed and transplant into rich deep soil, in rows 18 inches apart each way. The treatment should be generous in regard to manure and water.

Gourds, Squashes, or Pumpkins (figs. 1197–1202). These are popular names for a large number of species and varieties of plants belonging to the Cucumber family. They are tender or half-hardy annuals, natives of the warm parts of both hemispheres, and cultivated in most tropical and sub-tropical countries. Many of them are hardier than the Cucumber and the Melon, and succeed very well in the open ground in ordinary summers in the southern parts of Britain.

They cross readily with each other, so that it is difficult to keep any one distinct if other sorts are growing in the neighbourhood and flowering at the same time.

The best known of the hardier sorts of Gourd belong to the following:—

CUCURBITA MAXIMA, with stout unfurrowed stalks, leaves broader than long, with rounded lobes. To this belong the Large Yellow, Ohio, and Turk's Cap Gourds, also the common Pumpkin.

C. PEPO, with slender deeply-furrowed stalks, leaves deeply lobed, hairs very stiff. This comprises the Vegetable Marrows, the Custard Marrows, the Crook-neck, and the little Orange and Egg Gourds.

C. MOSCHATA.—Stalks slightly furrowed and much enlarged near the fruit; leaves deeply lobed, scented, often marbled; seeds rough. To this belongs the Naples, or Carpet-bag, and Yokohama Gourds. All the varieties of this require a warm climate to come to perfection.

All the sorts require the same treatment as the Vegetable Marrow. The seeds should be sown in heat, in April, and forwarded under glass; but after the plants are above-ground they should only be kept in very gentle heat. They must be shifted into larger pots, as may be necessary, and kept growing moderately, gradually exposing them to the open air previous to planting out, which should be done when the weather becomes sufficiently mild in May, sooner or later, according to season and climate. If heat is not at command, the seeds may be sown early in May in pots under a hand-glass; or, after the middle of May, they may be sown in the open ground.

The following are some of the sorts best deserving of cultivation:—

Canada Crook-neck.—Without doubt far superior to any other for the late or main crop. It is fine-grained, mealy, and of a sweet excellent flavour. By being kept in a dry and suitable temperature [not below 38°] the fruit may be preserved till the following summer.

Crook-neck (Early Bush).—Much cultivated in America, and esteemed the best sort for summer. It is a bush variety, very early and productive. Fruit crooked-necked, with numerous warty excrescences on the surface; colour bright-yellow; shell very hard when ripe. As it does not run, it may be planted 3 feet apart.

Crown Gourd (Bonnet or Scollop Gourd, Pattypan of the Americans).—The plant forms a round bush, and does not run. The fruit, which is produced very close to the stem, is flat and scalloped on the edge. In America two sub-varieties, Early Yellow and Early White, are cultivated, and used when young and tender for boiling as a vegetable, and at maturity for making pies.

Egg, Apple, and Orange Gourds.—In size, form, and colour these resemble the objects after which they are named. Trained on a pole, they are very ornamental. The fruits may be used in a young state, but in quality they are not equal to the Vegetable Marrow.

Egg-shaped Gourd (Reeves' Gourd).—Fruit weighing from 15 to 20 lbs.; but may be grown to upwards of 50 lbs.; short, ovate, sometimes tapering abruptly. Skin or shell hard, of a reddish colour. Flesh firm, red, excellent when ripe and cooked as a vegetable, or in any other way in which Gourds are prepared. The stems run to a very great length, and bear most abundantly.

Green-stripped Bergen.—A bush variety of strong growth, requiring to be planted 4 feet apart. Fruit small, bell-shaped, striped with dark-green and white. It is used both in the green and ripe state. It is cultivated to a considerable extent for the New York market; and, although it is not so productive as some, yet it is said to be comparatively hardy, ripening well even in the coldest seasons.

Harrison's Pumpkin is a very productive variety of the preceding, according to Kenrick, who states that it has produced upwards of 50,000 lbs. of fruit per acre.

Italian Vegetable Marrow.—This forms a dwarf bush with short reclining stems and upright leaves, which are deeply five-lobed. The fruits are used when the flowers are about to drop from their ends; they are then from 4 to 5 inches long, and 1½ to 2½ inches in diameter. When ripe, the fruit is from 15 to 18 inches in length, and about 6 inches in diameter. It is pale-yellow, striped with dark-green. It should, however, be used in the young green state, for when mature it is not so good as many of the other Gourds. It bears very abundantly, and as it does not run, may be grown in smaller compass than the true Vegetable Marrow.

Mammoth Pumpkin (Large Yellow Gourd, American Gourd).—This is the largest-fruited variety known. In a very rich compost above a large quantity of manure, and under favourable conditions of climate, it grows to an enormous size; fruit weighing 120 lbs. is by no means uncommon. In America it has weighed 226 lbs.; and at Sutcombe, in Devonshire, one weighing 245 lbs. was produced. This, we believe, is the heaviest fruit on record. The leaves are very large, and the stems thick, running along the ground to the distance of 20 or 30 feet if not stopped, and readily striking root at the joints. The fruit is round or oblate, sometimes flattened on the under side owing to its great weight, sometimes obtusely ribbed, yellowish, or pale-buff, frequently covered to a consider-

able extent with a gray netting. Flesh very deep yellow. It is only used in a full-grown or ripe state, in which it will keep for several months, and even during the winter, if preserved in a dry airy place, where it may be suspended in a strong net. The flesh is used in soups and stews, mashed, or baked in pies.

Spanish Gourd.—Fruit of medium size, very flat; skin smooth and hard, usually green. Flesh firm, and of excellent flavour.

Turk's Cap (Turban Pumpkin).—Fruit of medium size, flat, with a rounded margin and elevated centre, which is deep-green; the rest is yellow or pale-green. Flesh firm. Chiefly grown for ornament in this country.

Vegetable Marrow.—See p. 522.

Winter Crook-neck.—The kind most generally cultivated in New England for autumn and winter use. Fruit long, curved, and solid, of a pale-yellow; but the deeper the colour the better. An abundant bearer, excellent for pies. Being a runner, it should be planted 6 feet apart.

Hop (*Humulus Lupulus*). A perennial, native of this country. The use of its flowers in brewing is well known. In gardens it is principally grown as a screen to hide unsightly objects. Its young shoots, cut when about 4 inches above ground, are occasionally used in spring instead of Asparagus. Male and female flowers are borne on separate plants, the female being the one cultivated in plantations. Several varieties are distinguished by Hop-growers.

The Hop prefers a rich deep loam, deeply dug, and manured if necessary. It is propagated by division in spring or autumn, or by cuttings of the shoots of the preceding year taken off from the crown of the plant in March. If the plants are intended for the production of tops, they may be planted a foot apart, in rows 3 feet asunder; or in a single row near any object which it may be desirable to screen. Poles or sticks should be placed for them to climb upon, and the ground should be kept free of weeds, and stirred in spring and autumn.

Horehound (*Marrubium vulgare*). A perennial, native of Britain. Its leaves and tops have long been a popular remedy for coughs, particularly that which so frequently follows an attack of influenza or similar severe form of cold.

It may be propagated by dividing the plant in spring; by sowing the seeds in February, March, or April; or by cuttings, planted in a shady border in April. Plant 18 inches apart, in a dry warm situation. All the care necessary is to keep the ground clean, and the plants well last for many years.

Horse-Radish (*Cochlearia Armoracia*) (fig. 1203). A hardy perennial, naturalized in Bri-



Fig. 1197.—Crook-neck Early Bush Gourd.



Fig. 1200
Turk's Cap Gourd.

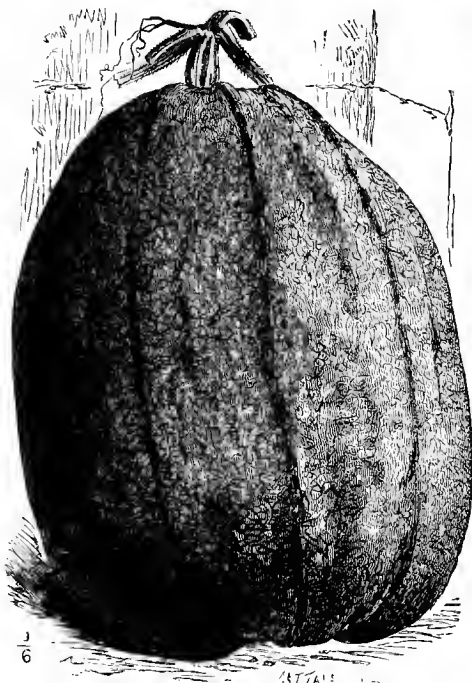


Fig. 1198.—Mammoth Pumpkin.



Fig. 1201.—White Squash.



Fig. 1199.—Custard Pumpkin.



Fig. 1202.
Patagonian
Squash.

tain. It is cultivated for its long roots, or more properly underground stems, the use of which, scraped into shreds along with roast beef, or grated with soups, is well known. It is antiscorbutic, and therefore important for a maritime nation, for the roots may be kept during a long voyage by merely burying them in sand.

It grows almost anywhere; but the best and most tender roots are produced in a deep, rich, and rather moist soil; a sandy loam sufficiently moist is suited for its growth, and it succeeds well in rich sandy alluvial soil.

It is propagated by planting pieces of the roots, any portion of which will grow even if deeply buried in the earth. It should be planted in rows 2 feet apart, on well-trenched ground.

Roots that were planted in spring may be taken up in the autumn and winter of the same year. If left, however, to grow another year, the roots become very much thicker, but at the same time they are not so tender as when taken younger. In taking up, dig down by the side of the row, and clear away the soil from the row to a little below the top of the set, and there cut the root, and remove it for use, leaving the portion below as a set to push again. The original set will thus be made a little shorter every season.

Large quantities of Horse-Radish are imported from Holland, where the soil is favourable for producing it; but that grown by the market-gardeners near London fetches a higher price in the market. Before severe frost, a quantity should be taken up, and placed in sand or earth in a shed or root-cellar, to ensure a supply when the ground is frozen hard, but it is best taken up immediately before use. Fresh plantations should be made every three or four years.

Insects, &c.—See chapter on this subject.

Leaf Enemies.—Garden Pebble Moth.

Hyssop (*Hyssopus officinalis*). An aromatic evergreen under-shrub, native of South Europe. An infusion of the tops and flower-spikes is sometimes employed as an expectorant.

Three varieties are cultivated, namely, com-

mon or Blue-flowered, Red-flowered, and White-flowered.

Hyssop succeeds in a light dry soil, with a warm aspect. It may be propagated by seeds sown in April; by dividing the plant in February, March, or in autumn; or by cuttings made in April or May, and planted in a shaded situation, and watered until they take root. The plants raised from seeds, and those from cuttings, may be planted out where they are to remain in June or July, at 1 foot apart each way, and watered till they take fresh root. Hyssop is sometimes planted or sown as an edging, in which case it must be taken up and replanted every two or three years, in spring or autumn, otherwise it will become ragged. All the care the plants require is an occasional trimming.

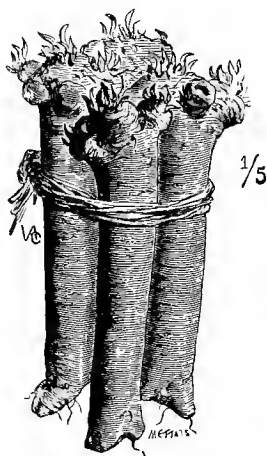


Fig. 1203.—Horse-Radish.

Indian Corn, or Maize (*Zea Mays*) (fig. 1204). Cultivated in all quarters of the world—Europe, Asia, Africa, America, and Australia, but to a less extent in Europe than in any of the others. As a cereal its ripening cannot be depended on in all seasons even in the south of England when sown in the open ground, and its



Fig. 1204.—Indian Corn (*Zea Mays*).

culture, consequently, has never taken a hold in this country; but raised in heat, and afterwards planted out, the crop ripened well for several years in succession at Chiswick. Attention has

recently been directed to it from another point of view—as a table vegetable. In America the cobs are taken as soon as the grains are plump, and boiled for about half an hour, more or less according to their age. Thus cooked, and eaten with salt and butter, they are highly esteemed, being considered fully equal to Peas. There is, however, nothing new in the cultivation of Maize being recommended for this purpose, for the celebrated William Cobbett in his *English Gardener*, published in 1829, wrote of it: "This is a very fine garden vegetable. The ear (cob) is stripped off the stalk just at the time when the grains are full of milk. The ears are then boiled

for about twenty minutes: they are brought to table whole; each person takes an ear, rubs over it a little butter and sprinkles it with a little salt, and bites the grains from the stalk to which they are attached, and which, in America, is called the cob. In the Indian Corn countries, every creature likes Indian Corn better than any other vegetable, not excepting even the fine fruits of those countries." Cobbett also recommended it as a field crop. "Several of the sorts will seldom ripen well with the heat which they get in the state of New York, requiring that of Carolina or Virginia at least. Other sorts will ripen perfectly well as far north as Boston; and



Artichoke—Jerusalem White.

Fig. 1205.

Artichoke—Veitch's Improved Long White.

there is a dwarf sort which will ripen equally on land 500 miles to the north of the last-mentioned place. Whether this be the same sort as that which I cultivate I do not exactly know, but mine never fails to come to perfection in England, be the summer what it may." There are now in this country varieties which are doubtless much superior to that which Cobbett grew, some of the best of which are: Adam's Early, Crosby's Early Sugar, Country Gentleman, Early Dwarf Sugar, Early Metropolitan, Early Minnesota, Extra Early Tom Thumb, Moore's Early Concord, and Triumphant Sweet.

The culture of Indian Corn is very simple. The seeds should be sown in April in gentle heat, and planted out, 2 feet apart, in good soil in a sheltered sunny position. One of the modes pursued in America is to dig holes a foot square and 8 or 10 inches deep, in the end of May, fill them nearly to the surface level with rank strawy manure, cover this with an inch or two of soil, place five or six seeds in each, put on an inch of soil, reduce the number of plants to three, and allow these to grow on.

Jerusalem Artichoke (*Helianthus tuberosus*) (fig. 1205). The Jerusalem Artichoke is a hardy tuberous-rooted perennial, and is closely related to the common Sunflower.

It produces numerous fleshy tubers which are baked, roasted, or boiled, and served with milk or butter, and in various other ways. They are much liked by some persons, and their flavour, when properly cooked, is agreeable. The plant is also sometimes grown near preserves, for the winter-feeding of pheasants, which are very fond of the tubers.

The Jerusalem Artichoke was one of the many plants recommended as a substitute for the Potato, and it is probably the best that has as yet been proposed. It is much more hardy than the Potato, as easily cultivated, thrives in the poorest soil and in the worst situations; and the nutritive value of the tubers is very considerable. Sutton's New White is an improved form with tubers of better flavour and more taking appearance than the old purple form.

It grows well in a sandy loam, in an open situation. It is propagated by planting small

tubers, or pieces of larger ones, each piece being furnished with two or three eyes. Previous to planting, the ground should be deeply dug or trenched, and manured if necessary. The sets may be planted in the end of January, in February, or March, either in shallow trenches 4 or 5 inches deep, or in holes made to that depth with a dibbler. They may be placed 1 foot apart, in rows 3 feet asunder. The rows should run north and south in order to admit the sun's rays, which would otherwise be to a great extent excluded by the luxuriant foliage of the plants facing the south. After planting, with the exception of hoeing the ground occasionally and drawing a little earth to the stems, nothing further is required till November, when the tubers will be fit to take up, to be stored in sand, for use in winter; but as they are not injured by frost, and keep best in the ground, the greater portion of them may be allowed to remain, to be taken up as wanted; if, however, the ground is required for other purposes, the whole crop may be taken up and pitted like Potatoes. In digging them up, which is best done with a fork, care should be taken to remove all the tubers, as any that are allowed to remain will spring up when the growing season arrives; for this reason, the plant is not easily eradicated from where it has once been grown. A fresh plantation should be made every year.

Kidney or Haricot Bean (*Phaseolus vulgaris*) (fig. 1206). The Kidney-Bean, or French Bean, is a tender annual, a native of South America, according to De Candolle: "It has not been long cultivated in India, south-west Asia, and Egypt; it is not certain that it was known in Europe before the discovery of America; at this epoch the number of varieties suddenly increased in European gardens".

There are two well-marked varieties, namely the tough-podded, the pods of which are tough and leathery when ripe, and the edible-podded, the pods of which never become stringy, and are therefore useful as a vegetable when mature. These are again divided into tall or climbing sorts and dwarf sorts. They differ from the Scarlet-Runner Bean (*P. multiflorus*) and the Lima Bean (*P. lunatus*).

The Kidney-Bean is an important and excellent vegetable, affording a large amount of produce from a small space. When the weather is sufficiently warm it soon yields a supply, and continues to do so in succession for a long time. If the green pods are superabundant in summer, they may be preserved in salt for use in winter;

they may be made into a pickle alone, or together with other vegetables; and, finally, the ripe seeds can be used in a variety of ways—in haricots, soups, and stews.

Cultivation.—Originally from the warm parts of the world, the Kidney-Bean requires a warm soil and situation. For early crops, more espe-

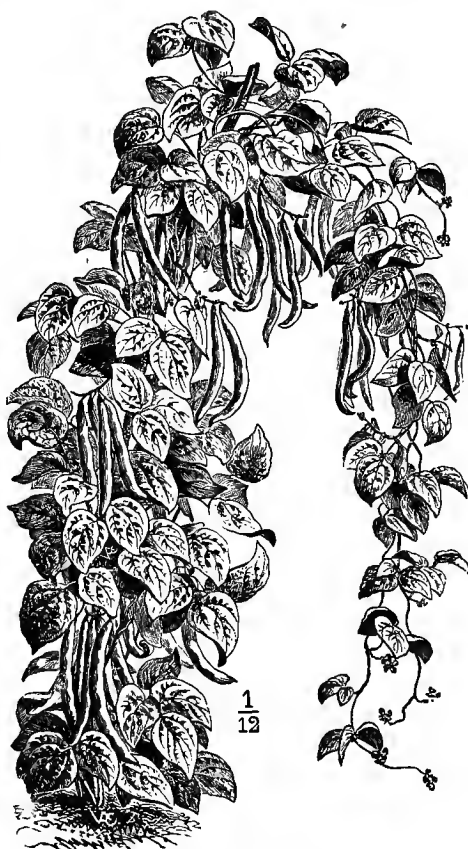


Fig. 1206.—Kidney or Haricot Bean.

cially, a rich sandy loam is desirable, and as warm a situation as can be afforded, such as the border in front of a south wall, or along the bottom of a wooden fence, but at the same time exposed to the sun. For the main crops, however, any well-conditioned garden soil will answer. For the latest crops a light warm soil and a good situation, similar to that for early crops, should again be chosen. In the northern parts of the kingdom it may, in some cases, be advisable to depend chiefly for a supply on the dwarf sorts grown on a south border, or on the flat ridges between early-dug Celery trenches—a position that suits this class of Bean admirably.

No manure is required where the soil has been manured for the previous crop; but where the soil is not rich, half-rotted stable-dung is

good for the early-sown crop, and for this a compost of light hot-bed dung and leaf-mould, the whole in a state that will readily permit the passage of water, may be put into the drills, made deeper than usual for the purpose of receiving it. This will afford nourishment to the plants, and will act as drainage. A mixture of leaf-mould, or decomposed dung and dry fibrous turf, will have a similar beneficial effect. For the main crop well-rotted manure is preferable, unless the soil is rather strong and damp, and in this case horse-dung partially decomposed may be used.

Sowing.—The principal sowing for the main crop should be made in the first week in May. The earliest may be made in the beginning of April, and the latest in July. These, and a few intermediate sowings, will suffice to produce a constant supply during the time that Kidney-Beans can be expected from the open ground.

Where there is no opportunity of forcing Kidney-Beans, it is desirable to use every available means to procure them from the open ground as early as possible. It is therefore advisable to sow early in April in small pots, in moderate heat, and to keep the plants well sheltered at night till they can be transplanted out-of-doors; or they may be sown in a frame, in rows 6 inches apart, and 2 inches asunder in the rows, and if likely to become too tall before the weather admits of their being planted out, they may be topped once or twice; or they can be placed in pots close to the bottom of a wall, and afterwards planted out in rows across the border. For the earliest out-of-door crops it is easy to protect the plants from frost, and the soil from being chilled, by means of neatly-made well-thatched hurdles, placed sloping on bearers supported by posts.

The seeds, especially if more than one year old, ought to be steeped six hours before sowing. When the ground is prepared, drills should be drawn so as to admit of the seeds being covered $1\frac{1}{2}$ or 2 inches deep. The direction of the drills for the early crop on a border in front of a south-aspect wall may be oblique from north-west to south-east. By this arrangement the sun's rays, when hottest, will fall almost perpendicularly, and consequently with the greatest effect, on the sides of the ridges formed by earthing up the plants, the rooting of which will be encouraged by the soil being thus heated. The distance between the rows should be about 2 feet. Where the soil is not very rich, some of the dwarfiest sorts may be in

rows only 18 inches apart, and the plants from 4 to 6 inches from each other in the row. For the tall sorts from 3 to 5 feet may be allowed, and the plants may be from 6 to 8 inches apart in the rows. Some plant in patches. For the earliest and latest crops this may be done with some advantage as regards shelter; for example, hand-glasses could be placed over the patches when sown, and whilst the plants are being reared in spring; and in autumn circular basket-work, covered with some warm material, employed for protecting the plants from frost.

The subsequent cultivation consists in watering when needful, stirring the soil, and earthing up. The latter operation is not absolutely necessary, yet in wet seasons, and in cold soils, it is of considerable utility, for it has been observed that when the lower fibres of the root have mostly perished from much wet, fresh fibres have pushed from the stem in the upper part of the ridge. The running kinds, including the new climbing, should be staked like Peas, if sticks can be cheaply and easily obtained; but if not, the running tops should be pinched off when the plants are from $1\frac{1}{2}$ to 2 feet high.

Gathering the Crop.—In some cases the pods are required when small and young, in others they are allowed to grow larger; but in any case they ought to be gathered whilst they are so crisp as to readily snap when bent. When the seeds are to be used in the dry state, the crops should be only gathered when the pods are quite dried up. In gathering for use in the state of green pods, none should be left that are getting too old. If they are removed, new ones will continue to be formed in great abundance; whereas, if allowed to remain till the seeds approach maturity, the formation of young ones is, in a great measure, prevented.

To save Seeds.—The best seeds are produced from plants sown at the earliest season that their growth can proceed without a check, and this is generally the case with the May sowing. The first-formed pods should be reserved, except some of the smallest, which may be thinned out. After a considerable number of pods have been thus reserved on each plant, it will be advisable to gather, in a young state, all that may be subsequently produced. By these means plump and well-matured seeds will be obtained. If dried and kept in the pod, the seeds will be preserved good for four years; if taken out of the pod, their vitality cannot be ensured for more than two years.

Forcing.—Kidney-Beans may be grown in

pots in any forcing-house in which they can be duly exposed to light. Where the temperature can be properly regulated, a minimum of 60°, and a maximum of 75°, or 80° by sun-heat, will be found most suitable. The bottom-heat ought



Fig. 1207.—Kidney-Bean—Early Favourite.

at least to correspond with the mean temperature of the house. Early dwarf sorts, such as Early Favourite (fig. 1207), Ne Plus Ultra, Sion House, Osborn's Forcing, with Canadian Wonder for the later supplies, should be used for forcing.

The seeds should be sown in 8-inch pots three parts filled with light, turfy loam and leaf-mould or decomposed cow-dung, placing from nine to twelve new seeds in each pot, and covering with $1\frac{1}{2}$ inch of soil. New seeds germinate quicker and stronger than old seeds. Before the plants crowd, thin to five or six in a pot for a quick crop, and to three in a pot for a more continuous one. The old-fashioned plan of allowing room for and giving top-dressings has nothing to recommend it—is so much wasted labour, in fact. Support the plants either with birch or hazel spray, or by means of sticks and strips of raffia. During April and May deep narrow boxes should be substituted for pots, as being the least affected by strong sunshine, and the plants they support are, as a consequence, less liable to be spoilt by red spider.

Kidney-Beans do well when planted in heated pits or in frames on hot-beds in succession to early Potatoes in May and June, or when the houses are too hot for pot culture. Avoid overcrowding. The rows should run from the back to the front of the lights, and be fully 15 inches apart. The plants must not be allowed to get too dry, or red spider will be encouraged. They should be well syringed till they come into flower. It is impossible to thoroughly moisten the under side of the leaves by syringing; but if this is done by syringing early in the morning, and the house kept shut up for a little while, a saturated atmosphere will do the work as thoroughly as if the plants were completely immersed in water. This is a great help against the attacks of red spider. Give plenty of air when the plants are in flower, and feed regularly with liquid manure. Kidney-Beans fit for use may be obtained by forcing in six weeks or two months from the time of sowing. Some seeds, therefore, may be sown in August to succeed the crops in the open ground; and for succession, other sowings may be made every month or so till the following March.

Dwarf Sorts.

Black Belgian.—From 12 to 15 inches high; good for forcing, and for the earliest and latest crops in the open ground. If sown and forwarded in pots, and well-exposed in favourable intervals till the ground becomes warm, and then planted out, it will soon come into bearing. Or, if sown at an advanced period of the season, it will produce pods till cut off by frost; whilst most other sorts, if sown at the same time, would not even blossom.

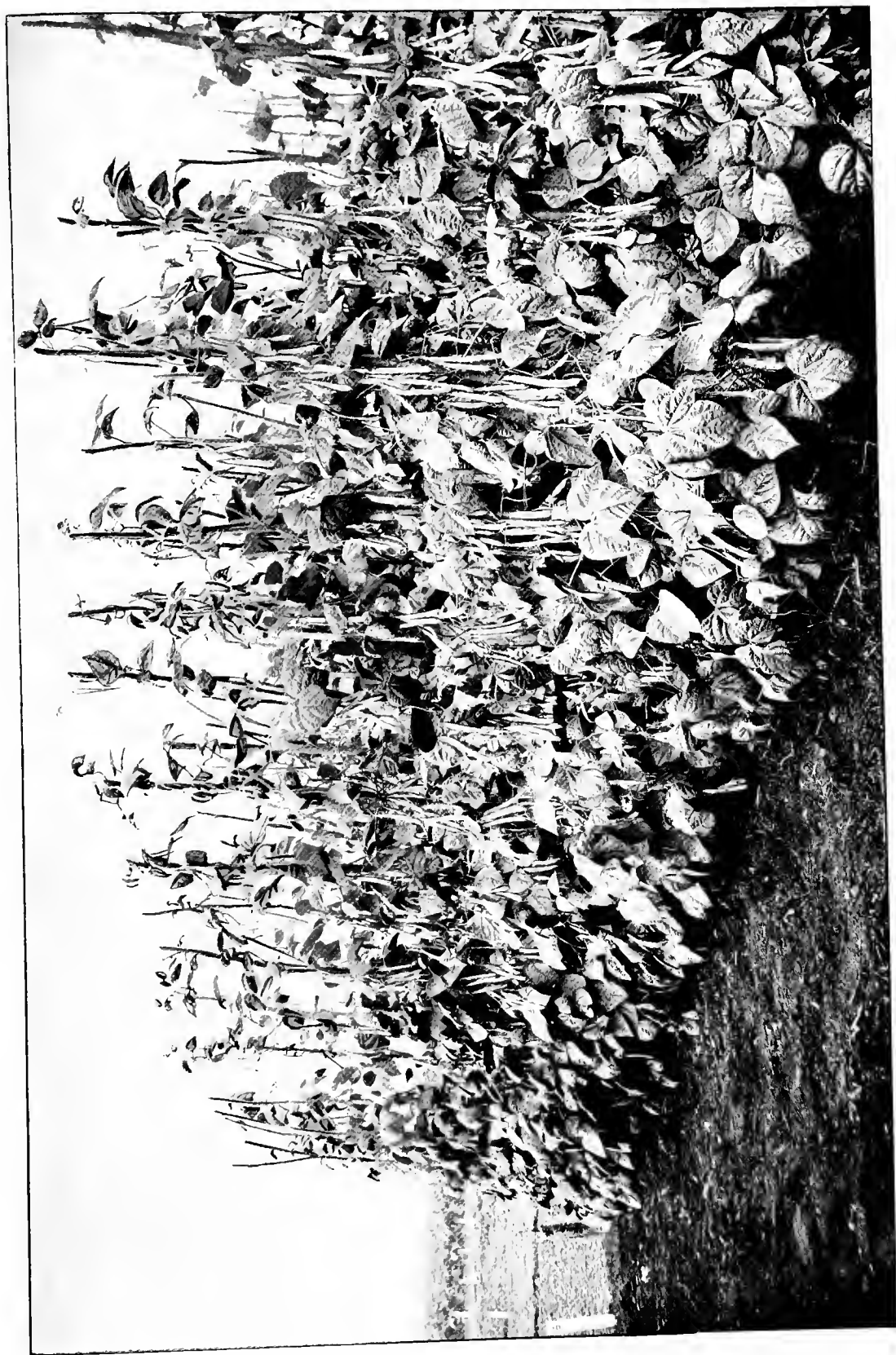
Canadian Wonder.—A strong grower and heavy cropper, 15 to 18 inches high; pods long, straight, and tender; seeds red-purple. A very popular Bean.

Cutbush's Giant Dwarf.—A robust-growing variety, and a great and heavy bearer; adapted for the second early or main crop; the pods are very long, thick, fleshy, and handsome. Seed long, crimson.

Dwarf Butter.—A vigorous bushy variety, about 2 feet high, and a great bearer; pods 3 to 4 inches long, thick and fleshy, of a pale-lemon colour, which they assume when quite young and retain throughout; they are very tender when cooked and of excellent quality. The seed is black.

Early Dutch.—From 12 to 15 inches high; pods long, slender, excellent when green. Suitable for forcing, and almost exclusively employed at Paris for that purpose.

Early Favourite.—An early variety for forcing or general use, producing an immense crop of pods from 7 to 9 inches long, and of superior quality. It is a cross



CLIMBING FRENCH BEAN—EXCELSIOR

between *Ne Plus Ultra* and *Mohawk* and combines the size and productiveness of the one with the delicate flavour of the other.

Early Mohawk (Early Six Weeks).—About 15 inches high. A very productive variety, much esteemed in America on account of its being very early and hardier than many others.

Early Wonder.—A selection from the well-known *Smythe's Hybrid*, from which it is quite distinct in habit, shape of pod, and colour of seed; from its dwarf compact habit, earliness, profuse-bearing qualities, the tenderness and excellent flavour of its pods, it is a favourite for forcing.

Long-podded Negro (Black Canterbury).—Grows about 15 inches high, producing broad luxuriant foliage. Pods long, of uniform breadth, and very succulent. In rich soil the plants should be topped, and restricted to a foot in height.

Magnum Bonum.—A distinct Dwarf Bean with long elegant pods, produced with even greater freedom than *Canadian Wonder*.

Ne Plus Ultra.—Stems about 1 foot high; early and productive; tender when young and also in a dry state; pods of medium length, crisp; seeds brown.

Osborn's Early Forcing.—An excellent dwarf and early variety of very productive habit. The mature seed is dark-brown speckled.

Plentiful.—Pods long, freely produced, and practically stringless. One of the earliest croppers. The pods are fit to gather in about ten weeks from the time of sowing on a sunny border.

Progress.—A distinct variety of dwarf habit, adapted either for early forcing or the open ground, recommended on account of its extreme earliness and free cropping qualities for first supplies in the open. Pods long, straight and fleshy.

Royal Dwarf.—A very early sort, of dwarf compact habit, and producing abundantly its fine medium-sized pods.

Sion House.—From 12 to 14 inches high; pods long, crisp, and tender. An abundant bearer, and an excellent forcing variety; pods frequently tinged with purple.

Sutton's Perfection (fig. 1208).—Pods extremely fleshy and succulent, almost round. The plant has a branching habit, which prolongs the time of bearing, and the long handsome pods are produced in great profusion.

Veitch's Hybrid (fig. 1209).—A cross between the *Scarlet Runner* and a *Dwarf French Bean*. It is a robust grower and very prolific, having long erect racemes bearing three to five well-shaped, broad, thick pods which partake somewhat of the character of the *Scarlet Runner*. Unsurpassed for a main crop, and if the pods are picked as they become ready, will continue to bear for a very long period. The plant grows about 15 inches high, and should have space to allow for its full development.

Yellow Canadian.—About 15 inches high; early. Pods very tender and excellent.

Runner Sorts.

Algiers.—One of the *Butter Beans*; height 8 feet. According to the *Bon Jardinier* this variety has long

been cultivated in Lorraine, and has appeared under the name of *Haricot beurre* and *Haricot ciré*. Pods yellowish, destitute of tough lining, tender and soft when cooked.

Chelsea Giant White.—The largest-podded *Runner Bean*, and remarkable for its free-cropping habit and continuous bearing; pods thick, fleshy, often measuring 15 inches in length, proportionately broad and of first-



Fig. 1208.—Kidney-Bean—Sutton's Perfection.

rate table quality. Excellent for exhibition and general purposes.

Earliest of All.—A *Runner Bean* with exceedingly fleshy pods, succulent and almost stringless. Young pods 3 inches in length, and cooked whole, possess a delicacy of flavour far superior to older pods sliced in the ordinary manner.

Epicure.—A climbing *Bean*, producing pods in great bunches from bottom to top of the vines. The pods are very thick, fleshy, almost round, and when fit for use the seeds are scarcely visible. The crop comes in early, and by successional sowings the plants will bear freely until late in the season.

Excelsior.—The plants run very freely, often attaining the height of 10 feet, and are covered with clusters of handsome pods. Apart from its great value for table use, this variety has proved a boon to exhibitors.

Haricot Lentille.—Height 5 to 6 feet; pods rather thin-sided, and the seeds become soon prominent; therefore its cultivation for use in a green state is not to be recommended. The dry seeds, however, are of excellent quality, and on this account they are much cultivated near Paris.

Princess of Wales.—One of the earliest, and of strong

climbing habit. Is extremely fruitful and continues in bearing for a long period. Pods long, straight, tender, and delicious. Seed white.

Sabre.—Plants 7 to 9 feet high, requiring strong sticks. Pods curved, remarkably large, from 10 to 14 inches in

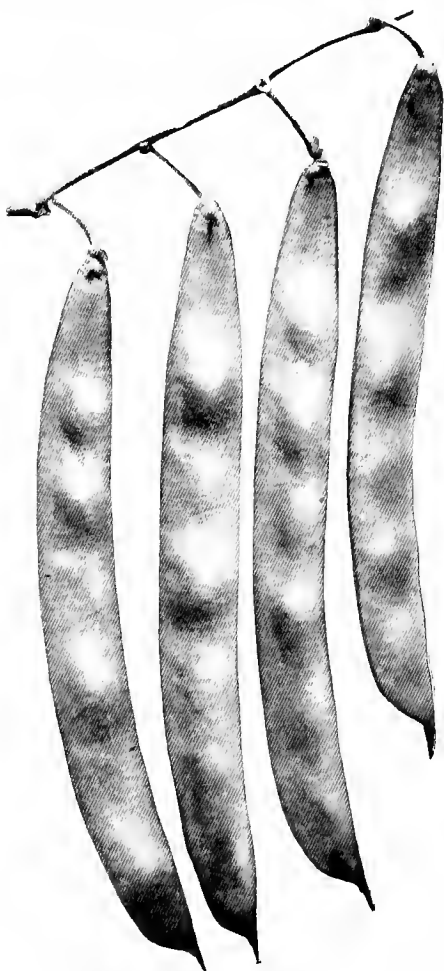


Fig. 1209.—Kidney-Bean—Veitch's Hybrid.

length and about 1 inch in breadth when full-sized; tender, even when the seeds are half-grown, and they may then be used fresh, or they may be cut into narrow strips and preserved with salt for winter use. In point of quality, whether in the green or dried state, the French rank this variety amongst the best. It does not, however, produce so long a succession of green pods as some others, neither does it bear so abundantly.

Tender and True.—Produces long, straight pods as early as Canadian Wonder. To assist the plants in climbing freely, the sticks should be placed much closer together than for ordinary Runner Beans. *Veitch's Climbing* appears to be the same as this.

White Longpod.—Height 6 or 7 feet; excellent in a dry state, and much cultivated for use in that way, especially at Soissons, where it is said to acquire a finer flavour than elsewhere. A late sort.

Kohl Rabi or Turnip Cabbage (*Brassica*

oleracea carlo-rapa) (fig. 1210).—This holds a place intermediate between the Cabbage and the Turnip, the upper part of the stem swelling into a round fleshy Turnip-like head. It must not be confounded with the Turnip-rooted Cabbage, or *Chou-navet* of the French, the root of which is tuberous.

Kohl Rabi is exceedingly hardy, withstanding even severe frost. It also resists drought better than the Turnip; but in every other respect it is inferior to that vegetable. Though much cultivated in Germany, it has not found much favour in British gardens.

The Early White and Early Purple are by far the best for table use; and when taken young, and properly dressed, they form an excellent substitute for Turnips, especially in dry seasons, when a crop of the latter may fail or be of inferior quality.

Seeds may be sown either thinly broadcast, or in drills 4 inches apart, in April, May, June, and July. When the young plants are an inch or two in height, they may be transplanted into any good, well-manured piece of ground, planting them 8 inches apart, in rows 15 inches asunder, and not deeper in the ground than they were in the seed-bed. Water should be given till they take fresh root, and subsequently in dry weather, as required; for though the plant suffers little from drought, yet the tenderness of the produce is greatly impaired by an insufficient supply of moisture.

The crop will be fit for use when the bulbs are of the size of an early Dutch Turnip; when



Fig. 1210.—Kohl Rabi

larger it is only fit for cattle. In the varieties grown in the fields, the bulbs sometimes attain an immense size, weighing in some cases as much as 14 lbs.

Lamb's Lettuce. See CORN SALAD.

Lavender (*Lavandula Spica*).—An aromatic under-shrub, native of South Europe. It is cultivated in almost every garden for its flowers, which are dried and put into wardrobes. They yield, on distillation, the highly-esteemed perfume lavender-water; and for this purpose it is grown on a large scale in the neighbourhood of Mitcham, in Surrey.

Lavender succeeds best in a light, warm, and dry soil; in such, also, it resists frost better, and is more aromatic, than when planted in a rich moist one. It may be raised from seeds sown in spring; but the universal method of propagating it is by slips, taken off if possible with roots in March, April, or September.

Leek (*Allium Porrum*) (fig. 1211).—A hardy biennial, said to be a native of Switzerland. It was cultivated in this country prior to 1562.



Fig. 1211.—Leek

The Leek prefers a light rich soil and an open situation. Well-decomposed stable-dung should be applied in the autumn of the year previous to sowing, for strong and recent manure is injurious to this crop. The seeds should be sown thinly broadcast, and lightly covered with earth, which should be beaten firm with the back of a spade; or it may be sown in shallow drills 6 inches apart.

A small quantity to come in early may be

sown about the middle or end of February if the weather is favourable. The principal crop should be sown about the middle of March, and a small quantity for a succession in the end of April. With the exception of thinning where too close, watering in dry weather, and keeping the ground free of weeds, nothing further is required till the young plants are fit for planting out; those of the late crop may be planted out in August. A moist day should be chosen for the operation, or, failing that, the ground should be previously well watered. The plants may be replanted in four ways, namely—

1. In the bottom of a furrow or trench, about 6 inches deep, prepared as for Celery, the earth being drawn in as the plants grow larger, so as at last to fill the furrows level with the rest of the ground. This plan answers well when extra fine Leeks are desired. The plants should be raised in heat, sowing the seed early in February, and pricking out the seedlings into boxes of rich soil. They should be kept growing in gentle heat, and not far from the glass, till quite strong enough for planting, when they ought to be hardened and carefully transplanted to the shallow trenches. Keep well supplied with water and liquid manure, and in order to keep the stems perfectly clean bandage with brown paper prior to moulding up.

2. Holes about 3 inches in diameter and 8 inches deep may be made with a dibber, and in these the plants should be placed upright, watering them and allowing little more earth to fall in at the time than is sufficient to cover the roots, or at all events not more than will come up as far on the stem as the latter was in the ground previously. A good supply of stout well-blanching Leeks during autumn and winter is thus secured.

3. A trench from 9 inches to a foot wide may be taken out along one side of the quarter, and the soil taken where it will be required to fill up the last opening. Dig over and level about 1 foot wide from the side; then at 9 inches from the latter stretch the line, cut down perpendicularly by it with the spade, and bring back the 3 inches towards the undug ground, then plant the Leeks against the perpendicular cut made by the line in the newly-dug ground, spreading their roots, and placing them as low as can be done without burying the hearts of the plants when the soil is made level. The ground can even be lowered after planting the row, so as not to cover the green part of the bases of the leaves, or at most but very little of them.

4. They may be planted on the surface by the dibber quite as deep in the ground as they previously were, and be so allowed to grow, and as they advance in growth they may be gradually earthed up.

In shallow soils, or where there is a damp subsoil, it will be advisable to adopt the last method; but where the contrary is the case the largest and best-blanced stems are obtained by the other methods, and of these the second is, in our opinion, the simplest and best.

Another method is to plant them 9 inches apart, in rows from 12 to 18 inches asunder, according to the richness of the soil and the variety. Water should be given at planting, and moderately afterwards. With the exception of loosening the soil with the hoe, and drawing earth to the stems, where that method is adopted, nothing further is required. In September the Leeks will be fit for use, and will continue so throughout the winter and spring—those of the late sowing till the end of April. Any then remaining may be taken up and planted close together, but not touching each other, in deep trenches, in a cool situation, in order to prevent them from running to stalk. With the same view the bottom from which the roots proceed may be cut off, and the Leeks kept in a cool cellar.

In order to obtain seeds, some of the largest and most vigorous plants should be taken up in March and planted in a warm sheltered situation. The seeds ripen in autumn, the heads changing to a brown colour. They keep best in the heads, and these should be cut off with a portion of the stalk a foot long, tied in bunches, and hung up in a dry airy shed. In this way the seeds will retain their vegetative power for two or three years; after that time they are not to be depended on.

The best varieties are:—

Ayton Castle Giant.—Leaves moderately broad; stem long and stout, blanching well.

Large Rouen.—Leaves dark-green, broad, thick. Stem short, thick. Said to grow as thick as a man's arm in the soil and climate of Normandy. Much cultivated near Paris, and since its introduction to this country it has been much approved.

London Flag.—Tall, with a thick stem; leaves broad; generally cultivated.

Musselburgh (Scotch Flag).—Very large and hardy; leaves broad and tall; stems long and thick.

Prizetaker.—Stems of this have been grown a foot long and 5 inches in diameter. They are solid, pure white, and of mild agreeable flavour.

Royal Favourite.—Raised at Frogmore. Remarkable for its broad leaves and large pure-white stems, which are solid and straight. A first-rate exhibition sort.

Small Early Netherlands.—Leaves long, narrow, dark-green; stem small. Not so well adapted for a main crop, being apt to run to seed before winter. A small sowing of it may, however, be made for early use.

The Lyon.—One of the largest and most popular for exhibition. Blanches well, and is of mild flavour.

Yellow Poitou.—Very large, leaves 5 feet in length and upwards of 6 inches wide. The underground or blanched part of the stem is yellowish-white, and when boiled is tenderer than any other variety. Preferred at Paris for forwarding on a hot-bed.

Lentil (*Ervum Lens*) (fig. 1212).—An annual, native of South Europe. Largely cultivated near



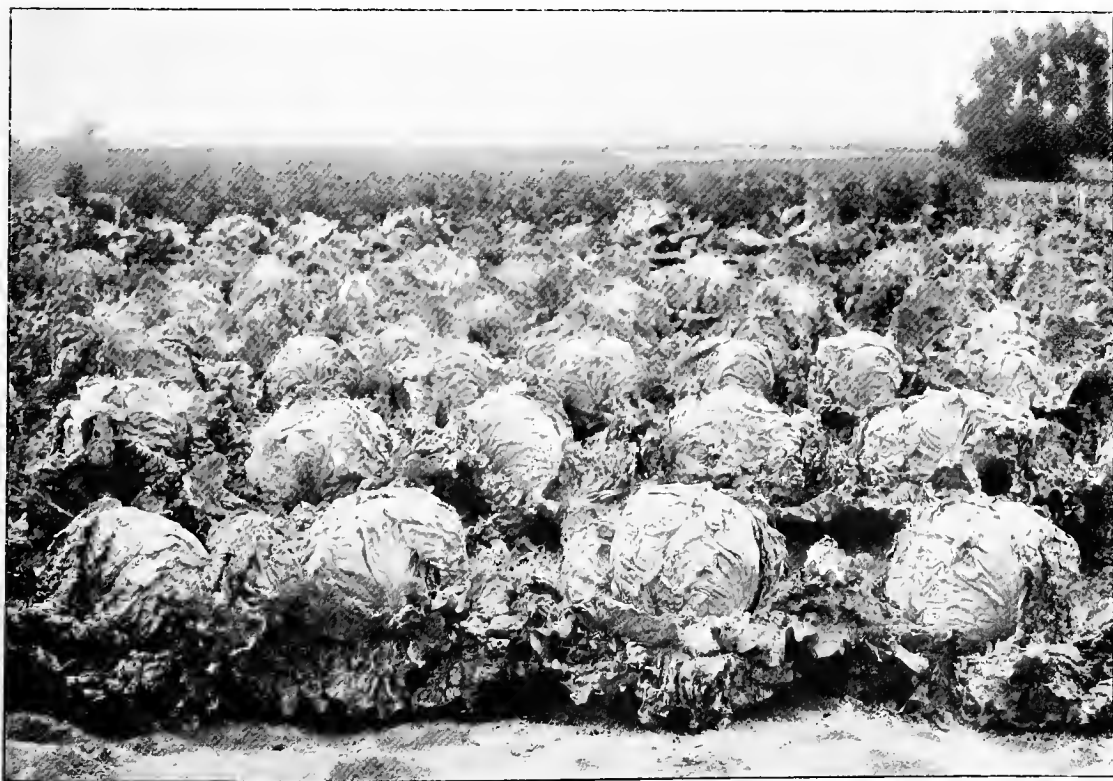
Fig. 1212.—Lentil.

Paris, both in fields and gardens, for the seeds, which are much used in cookery. It is one of the most nutritious of the pulses; and if good, freed from the outer skin, and cooked till soft, is a good remedy for indigestion. Revalenta arabica is, or should be, made from the meal of the seeds. It prefers a light, warm, dry soil; if planted in one that is rich it grows vigorously, but produces only a small quantity of seeds. It should be sown in March or early in April, in drills 20 inches asunder.

When the stems begin to turn yellow, and the pods assume a darker colour, the plants are



COS LETTUCE



CABBAGE LETTUCE

pulled up, dried in the sun for two or three days, and then placed under cover. Lentils keep best in the husk; in this way they remain fit for food or for sowing for two years.

Lettuce (*Lactuca sativa*).—A hardy annual, native of India or Central Asia. It has been cultivated in this country since the middle of the sixteenth century.

To obtain good Lettuces in the early part of summer preparation should be made late in July or early August. An open space sheltered from the north and north-east, and having a hard surface, should be selected, and the dimensions of a one-, two-, or three-light frame, according to the supply required, should be traced out. One thousand plants, fit for planting out, may be reared in each light; but allowance should be made for accidents. The frame should either face the south-east, south, or south-west. The bed should consist of stable-litter, shaken and beaten with the fork, so as to be as equally compact as possible. It should be about 2 feet high at the back and not more than 1 foot in front, for it is necessary that the sashes should have a steep slope, in order that the moisture may run down the glass rather than drip on the plants. The frames should not be more than $4\frac{1}{2}$ feet wide. The object of putting up the bed so long before the time of sowing is to allow the litter to settle and fermentation to cease, the stimulus of extra heat not being required.

The soil for the frames should be got ready in the first week of October. It must be light, but it need not be very rich. Leaf-mould is very good, and it may be mixed with a little sand, and put on 6 or 7 inches thick; at all events, it should be filled in to within 5 inches of the sashes. The seeds should be sown in the second week in October. After sowing, the sashes should be kept on till the seeds begin to germinate, when air ought to be freely given, and the sashes drawn quite off in favourable weather during the day. If the plants get frozen, the frames must be kept close till the plants are thawed. If a sash be lifted up when the plants beneath it are stiff with frost, they are almost sure to damp off; therefore great care must be taken in giving air at such times. The external air should not be admitted in large quantity when it is much warmer than the soil in the frame, or the moisture of the warmer air will be condensed, and the plants will be liable to damp off in consequence.

Very little watering will be required. When

the plants are up, and as soon as they can be handled, they should be thinned by removing the weakest seedlings, so that those left may be about $1\frac{1}{2}$ inch apart. The aim should be to keep the plants merely growing till the days begin to lengthen; therefore, during December, if occasional sunshine should throw heat into the frame, the stimulus must not be taken advantage of. On the contrary, additional air should be given, so that the sun-heat may escape, rather than accumulate to stimulate the plants.

In January, if the weather be favourable, a more active growth should be encouraged; but it is still desirable that it should be steady. If the plants are backward in growth, the directions for giving abundance of air may be somewhat modified, and less air may be given in

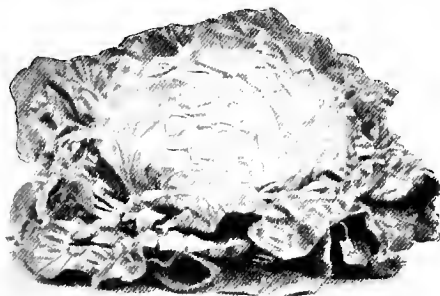


Fig. 1213.—Cabbage Lettuce—Tom Thumb.

January, and till near the time of planting out, when the plants should again be freely exposed in all moderate weather. In January, the weather is sometimes unusually mild, with a south-west wind, but wet and sunless. There is then danger of the plants drawing up tall and weak before they can be planted out. In this case, whilst the sashes must necessarily be employed as protection from wet, yet they should be removed so as to allow a free circulation of air whenever it can be done with safety.

Planting out is done near London in January, but the preferable time is February. The object is to get the plants well rooted before the dry March winds set in. The ground should accordingly be prepared before that time. It should be light and well manured, not at top, but below the plants. The best kind of manure is fresh littery stable-dung, moistened with the manure-drainings from the stables. The dung should be spread equally over the surface about 2 inches thick. The ground should then be lined off for 2-feet trenches; the first trench being taken out one spade deep, the dung on the second space of 2 feet should then be turned into the bottom,

and covered with 6 inches or so of soil from the second trench; and so on, till the whole piece of ground be worked over. They are usually planted out at 1 foot apart each way. After planting, although there may be no weeds, yet the ground should be frequently hoed, or its surface otherwise stirred and kept loose. This greatly encourages the growth of the plants. Of course the ground should not be worked or trodden upon when it is in too moist a condition.

The White Paris Cos does not require tying up; nevertheless, like all other sorts, it is tied before being sent to the market, where, untied, Cos Lettuces would not sell so readily. The plants should be tied up when they are perfectly dry; strips of matting are used for the purpose, and in applying it the leaves should be first gathered regularly together, but not tightly, and the matting then put round a little above the thickest part of the head.

A succession should be sown in frames in the



Fig. 1214.—Cabbage Lettuce—Golden Queen.

same manner as already described, but at an interval of not less than three weeks after the first sowing, that is, not before the 1st of November. If there are not at least three weeks between the first and second sowings no succession will be ensured; for if the second should start more favourably than the first, the crop from both will become fit for use at nearly the same time. About the 5th of November will be a good time for the second sowing. The plants should be managed as directed for the previous sowing.

For a third succession sow again in frames about the end of January, or first or second week in February; and a small sowing should be made at the end of that month in light rich soil in a frame placed on the ground, or the plants may be sheltered with hand-glasses at

night, and also during the day, but with plenty of air.

As soon in March as the ground is in good condition and the weather favourable, sow in some warm situation some of the best Cos and Cabbage varieties. In April the different varieties of summer Lettuces should be sown on a border in front of a west-aspect wall, or between early-dug Celery trenches, more being transplanted to the same site, no other position better favouring the growth of extra-fine Lettuces. During hot dry weather, Lettuces transplant badly, and the late spring and summer sowings ought therefore to be made as much as possible where the plants are to remain. Sow Cos varieties in shallow drills drawn 1 foot apart and previously moistened, thinning to about 10 inches apart, while the Cabbage varieties

may be sown in drills 10 inches apart, and left from 8 inches to 10 inches apart in the rows—rather less space being given the smallest forms. In May and June successional sowings may be made in any open situation, as at this hot period of the season coolness is desirable for this crop. Sowings of Green Paris Cos, Brown Cos, and All-the-year-round, should be made in late June and mid-July, for use in autumn and in the early part of winter.

Between the 15th and 20th of August sow some of the Green Paris Cos, Brown Cos, Brown Dutch, All-the-year-round, and more especially the Hardy Hammersmith, as it is most to be depended on in case of a severe winter. They may be planted on the sides of ridges, which may be formed obliquely across a sheltered border in front of a wall, hedge, or boarded paling, facing the south. If the ridges are made from south-east to north-west, and planted with Lettuces on both sides, those on the north-east will have some portion of the sun's rays to dry the foliage in the morning, and those on the other side, facing the south-west, will receive nearly direct the sun's rays at the hottest time of the day. The Hardy Hammersmith may be planted on these ridges at 6 or 8 inches apart. In planting at the bottom of walls, care should be taken to avoid the drips from the coping.

Another sowing should be made towards the middle of September, for use in spring.

Lettuces are sometimes required for cutting young, or when about 2 inches high. The small early sorts, such as the Hardy Hammersmith, are preferred for this purpose; but any green-leaved sort will do. The seeds should be sown in the open air once a week, or every ten days, from April throughout the season. In winter they are best raised in heat. They should be sown rather thickly, in drills 6 inches apart.

Lettuces raised on an open border, as well as those raised in frames, should be thinned before the plants are drawn up weak and slender, as they never make such full succulent heads as those that by proper thinning have a shorter, thicker stem. Transplanting should take place as soon as possible after the plants have made two or three leaves. Advantage should be taken of cloudy weather for the operation. The ground should be made fine, and for the summer crops it cannot be too rich; in winter the plants will stand better in soil that is rather

poor; but when vegetation commences to be active in spring, manure-water will greatly promote their growth.

Forcing Lettuces.—The sorts which may be forced to afford a winter supply are—*Cabbage*: Hardy Hammersmith, White Dutch, Golden Queen, and Early Paris Market;—*Cos*: Brown, Green Paris, and White Paris. Seeds of these should be sown about the middle of August, and in the beginning and middle of September. These sowings ought to furnish plants for a supply throughout the winter and spring.

The seeds should be sown in rich light soil, or in a compost of well-decomposed dung, leaf-mould, and the soil from an old Cucumber bed. As soon as the seedlings are large enough to handle they should be pricked out in a bed prepared as follows:—

About the middle of October make a slight hot-bed, of about 18 inches thick, of well-pre-

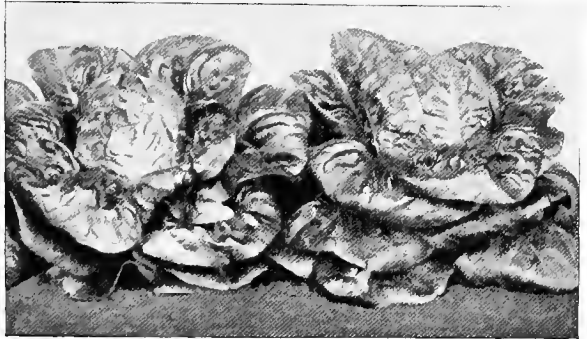


Fig. 1215.—Cos Lettuce—Little Gem.

pared dung. Cover this about 1 foot deep with a compost of sandy peat, leaf-mould, and a little well-decomposed manure. The bottom-heat should be about 55°. When the soil is put in the frame it ought to be thoroughly watered, and then allowed to get nearly dry. As soon as this is the case, take up the plants and plant them about 6 inches apart in the frames. Water slightly after planting, and then cover the whole surface of the bed with clean dry sand or dry peat. Some recommend charcoal, but it is apt to soil the foliage; peat-charcoal may, however, be employed with advantage. Shade from sun, and keep the lights close for a few days, till the plants have taken fresh root. Afterwards, give plenty of air when the weather permits. Care should be taken to prevent frost from reaching the plants. In case of severe weather the frame must be backed with litter, and instead of Russia mats, good straw-mats should be used for covering the sashes. In cutting the plants for use,

every alternate one should be taken so as to allow those left to develop. Quick-hearting Lettuces may be forced successfully in pots placed near the glass in a house or frame with a temperature ranging from 55° to 65°.

Lettuces are liable to be spoilt by frosts in the autumn. To save them they ought to be lifted and replanted in frames and pits, or in a border where they can be covered with benders and mats as often as need be.

To save Seeds.—The finest specimens should be selected, those that heart readily, and are slow to run up, being preferred. In order that the sorts may be kept true, care should be taken that no two different varieties be allowed to seed near each other. The seeds which ripen first on the plant are the best. The branchlets which first ripen their seeds should be cut off, and laid on a cloth in the sun. Or when the forward portion of the seeds is as near maturity as it will safely bear without shaking off, the plants should be carefully pulled up, and placed upright against a south wall, with a cloth under them, to perfect their ripening. The seeds retain their vitality three or four years, although none should be depended on without trial. Plants from seeds two years old heart more readily than those from one-year-old seeds.

Insects, &c.—See chapter on this subject.

Fruit and Seed Enemies.—Lettuce Fly. *Leaf Enemies.*—Cabbage Moth. *Root Enemies.*—Daddy Long-legs, Dart Moth, Ghost Swift Moth, Lettuce Root Aphis, Pot Herb Moth, Wireworm, Yellow Underwing Moth.

The varieties of Lettuce are divided into two classes:—CABBAGE, with round depressed or spreading heads; and Cos, with erect conical heads.

Cabbage Lettuces.

All-the-year-round.—Hardy, compact, solid, and crisp-hearted. One of the oldest and most popular.

Black-seeded Gotte.—Grows close to the ground. Leaves forming a compact white heart, about 4 inches in diameter, of excellent quality. A good forcer.

Brown Dutch.—Resembles White Dutch, but the leaves are of a darker-green on the under side, and more brown where exposed. It hearts freely, and blanches white, crisp, and is of excellent quality.

Commodore Nut.—An excellent early sort, and one of the best for general use. It is compact, hearts well, is crisp, and exceptionally good in flavour. Colour dark-green.

Crêpe.—Small, quickly forming a loose white heart.

Golden Queen (fig. 1214).—A small early variety of a pleasing yellowish hue. It forms solid hearts, and does not soon run to seed. It is one of the quickest to mature.

Hammersmith Hardy Green.—Leaves of thick substance,

dark-green, wrinkled, and concave. An excellent winter Lettuce, but soon runs to seed in summer.

Large White Cabbage.—Leaves smooth, with an even surface; pale-green. Hearts large, compact, somewhat flattened; does not run quickly to seed in hot weather. A very good summer variety.

Little Gem (fig. 1215).—An excellent early variety, after the style of Tennis Ball but larger; matures early, and is crisp and sweet.

Malta.—Leaves pale-green, smooth and soft, dentate, not curled on the margins. Hearts flat, compact, blanches white and tender, less crisp than the Neapolitan, to which, however, on account of its peculiarly soft texture, it is by some preferred, especially for stewing.

Neapolitan.—Leaves much curled on the edges. Hearts large, firm, white, crisp, and of excellent quality. The best of the summer Lettuces. Does not run to seed until late.

Tennis Ball.—Leaves dark-green, slightly curled; forming a small compact heart, blanching white and crisp. If sown in August it will come in after Hammersmith Hardy Green.

Tom Thumb (fig. 1213).—An old favourite, hearts well, is very hardy, stands drought, and is as good in appearance as in flavour. May be had almost all the year round.

Versailles.—Leaves paler green than those of the Neapolitan, heart not so firm; yet it is white, crisp, and of excellent quality.

White Dutch.—Larger than Hardy Hammersmith Green. Leaves roundish, yellowish-green, tinged with reddish-brown at the top; hearts readily, and is hardy. With a little protection in winter it is very good for spring use.



Fig. 1216.—Cabbage Lettuce—White Silesian.

White Silesian (fig. 1216).—Leaves undulated, pale-green, tinged with reddish-brown; hearts large, moderately firm, and of very good quality.

Cos Lettuces.

Artichoke-leaved.—Leaves long, upright, narrow, much cut or jagged, the outside ones brownish-green; the heart-leaves blanch white, some of the midribs being slightly tinged with pale-crimson; very tender, crisp, and excellent, even without tying; is very hardy, and will continue to furnish excellent salads when other Lettuces are either destroyed by frost, or have acquired a bitterness that renders them unfit for use. For late produce it should be sown in June and July.

Brown Cos (Bath Cos).—A hardy sort, the best for standing the winter. It grows to a large size, hearts well with a little tying up, and is crisp and excellent. The leaves are brown, but the heart, with tying, can be rendered white. The black-seeded variety is generally preferred. This is also good as a summer Lettuce.

Dwarf Perfection.—An admirable variety for an early crop. If sown in heat in January and planted out when weather permits, it forms a crisp, solid heart before the autumn-sown Bath Cos is ready. It does not readily run to seed.

Early Green.—Leaves pointed, very dark-green. Heart very crisp, but requires to be tied. Is not so large as Green Paris, but is earlier.

Green Paris.—Resembles White Paris, except that it is hardier, and its leaves, till blanched, are dark-green. The heart becomes white, crisp, and excellent. It will stand through ordinary winters, with a little protection, in a sheltered situation. Both White and Green Paris Cos are known under a great diversity of names.

Hicks' Hardy White.—Very hardy, large, and crisp. Stands a long time, and is well adapted for either spring or autumn sowing. It hearts well, and blanches perfectly.

Ivery's Nonesuch.—Very large; leaves broad and thick, a little tinged with brown; require to be tied for blanching. Has the merit of remaining long without running to seed.

Mammoth White (Balloon) (fig. 1217).—A summer variety which stands drought exceptionally well, and grows to an enormous size. First-rate for exhibition.

Spotted Cos.—Of medium size. Leaves spotted and streaked with red. The heart blanches and is very tender if the plant is tied.

White Heart.—A dwarf broad-hearted variety, self-folding, of excellent flavour, and growing to 6 or 8 lbs. in weight.

White Paris.—Leaves large, pale-green, hooded so that they close over, and a large heart is blanched without tying. White, crisp, and excellent. It continues growing and hearting for nearly a fortnight after other Cos Lettuces sown on the same day commence to run to seed.



Fig. 1217.—Cos Lettuce—Mammoth White.

Is generally esteemed as the best summer Cos Lettuce, and is the sort most extensively cultivated in the neighbourhood of Paris.

Liquorice (*Glycyrrhiza glabra*) (fig. 1218).—A perennial herb, native of South Europe. It has a fleshy root, which runs deep into the ground, and a stem rising from 3 to 5 feet high, clothed with dull-green pinnate leaves. The sweet mucilaginous juice, extracted from the roots by boiling, is much esteemed as an

emollient in colds. Large quantities are grown, for the use of druggists, in the vicinity of Mitcham, in Surrey, to which place its culti-

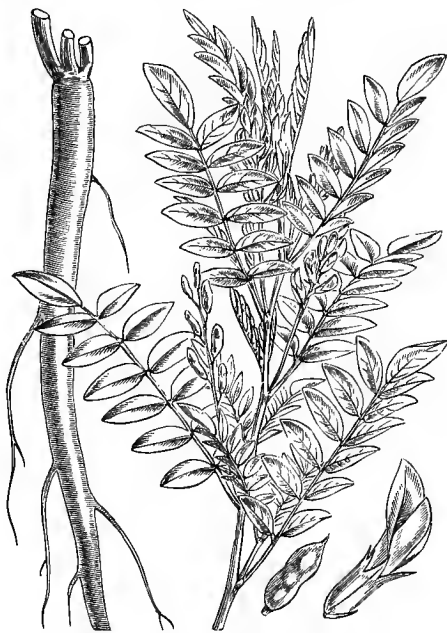


Fig. 1218.—Liquorice (*Glycyrrhiza glabra*).

vation on an extensive scale is almost entirely confined. A few plants are worth a place in most gardens.

Liquorice succeeds best in a deep, rich, and rather sandy soil, which should be heavily manured the year previous to planting, and trenched 2 feet deep in autumn, laid in ridges, and allowed to remain in that state till spring; or it may be trenched immediately before planting. The former method is the preferable one.

The roots should be planted in February, in rows 3 feet apart, and 18 inches from each other in the row. Every year, in November, when the sap has gone down and the leaves have turned yellow, the old stems should be cut down with a pruning-knife to the level of the ground. At this time also the creeping stems ought to be forked up, and cut off close to the main stems, and preserved in sand or in heaps covered with straw and earth for future plantations. The ground between the rows should be forked occasionally, and kept free of weeds. The roots will be ready for taking up three years after planting. This should be done in winter, after the descent of the sap. A trench about 3 feet deep must then be got out, and a rope being fastened round the top, the roots should be pulled up, after which they may be

stored in sand for use; or if there is a large quantity, they may be kept in pits like Potatoes.

Marigold (*Calendula officinalis*).—A hardy annual, native of South Europe. It is cultivated in the kitchen-garden for its flowers, which are put into soups.

It is raised from seeds sown in March or April, in shallow drills 1 foot apart. When the seedlings are 3 inches high they should be thinned out to 1 foot apart. They flower in June, and continue flowering till September. The flowers may be gathered when full-blown, dried in the shade, and stored for winter and spring use.

Marjoram (*Origanum*).—The aromatic leaves are used both green and dried for seasoning soups and other dishes. The leafy shoots should be cut when coming into flower, and dried in the shade, for winter and spring use.

Four species are cultivated:—

Common Marjoram (*Origanum vulgare*).—A perennial, native of Britain, growing naturally in thickets. It may be raised from seeds sown in spring, or by parting the roots in spring or autumn. Plant 1 foot apart in any soil that is not very moist.

Pot Marjoram (*Origanum Onites*).—A perennial, native of Sicily. It flowers from July to November, but seldom ripens seeds in England. It is propagated by dividing the roots in March or April, or by slips or cuttings taken off in summer and planted in a frame or under a hand-glass. It prefers a light and rather dry soil and a warm situation, and should be planted in rows 1 foot apart.

Sweet or Knotted Marjoram (*Origanum Majorana*).—A tender biennial, native of Egypt. In this country it will not stand the winter in the open ground; it is therefore raised annually from seeds, sown broadcast on a south border in the beginning of April. Or it may be sown in shallow drills 9 inches apart, thinning out when the plants are about 2 inches high to 6 inches asunder in the rows. Some may also be sown in March, on a slight hot-bed, either to remain for early use, or to be planted out at the above distances.

The flowers appear in June and July, and are collected into roundish close heads, resembling knots, from which circumstances it is frequently called knotted Marjoram. The seeds seldom ripen in Britain.

Winter Sweet Marjoram (*Origanum heracleoticum*).—A hardy perennial, native of South Europe. The flowers appear from June to November. It succeeds best in a dry soil, and is propagated by dividing the roots in spring or autumn, and planting the divisions 10 inches apart in rows 18 inches asunder.

Mint.—Three species of this are cultivated for economic purposes, namely, Spear-mint, Peppermint, and Pennyroyal.

SPEAR-MINT (*Mentha viridis*).—A hardy perennial, native of Europe, including Britain. The tops are used in soups and salads, in sauce for

lamb, and boiled with Peas and other vegetables. It prefers a moist soil, but will grow in almost any soil and situation. It is easily propagated by dividing the roots, or by offsets, in spring; also by cuttings about 6 inches long, taken off in summer, planted about 3 inches deep, and watered till they take root. In winter the old stems should be cut down, and the beds cleaned and covered with mould to the depth of 2 inches. In some soils, fresh plantations require to be made every three or four years; in others, only after the lapse of several years. When the plants are coming into flower, a quantity of tops should be cut and dried in the shade, or in a screen before the fire, for use in winter. A supply of green Mint may be had all through the winter by removing some roots to a warm frame, planting them in light soil. They should be exposed to sun and air in mild weather.

PENNYROYAL (*Mentha Pulegium*).—A hardy perennial, a native of Europe, including Britain. It succeeds best in a moist loamy soil, and is easily propagated by offsets, or by dividing the roots in September, March, or April. Plant in rows 1 foot asunder, and 6 inches from plant to plant in the row, and water at planting.

PEPPERMINT (*Mentha piperita*).—A hardy perennial, a native of Europe, including Britain. It is principally cultivated for the distillation of the well-known cordial that bears its name. It requires the same soil and treatment as the preceding species, and is propagated in the same way.

Morel (*Morchella esculenta*) (fig. 1219).—An edible fungus found growing in orchards, woods, and moist pastures. It is said to occur most abundantly in places where wood has been burned, or charcoal made. It grows to about 4 inches in height, and consists of a smooth white cylindrical stem, and a hollow spherical cap adhering to the stem by its base; pale-brown or gray in colour, and marked with deep pits all over its surface. The Morel is used either fresh or in a dried state, in gravies, stews, &c. It usually makes its appearance in spring or early in summer. It should not be gathered when wet, otherwise it will not keep well. It has not as yet been subjected to cultivation, but it is probable that if Morels commencing to decay, and the soil about them, were collected, and placed under different circumstances of soil, heat, and moisture, the attempt might prove successful, and a proper mode of cultivation be arrived at.

Mushroom (*Agaricus campestris*) (fig. 1220).—The Common or Field Mushroom grows wild in meadows, pastures, &c., and is most abundant in autumn. It is also largely cultivated, and in some countries Mushroom production has developed into quite an important industry. Like all Fungi it produces spores in abundance, but these in the field Mushroom do not appear to vegetate. It is, however, easily multiplied by means of the mycelium or "spawn". This has the appearance of a white thread-like mould, which retains its vegetative powers for many years, provided it is kept dry; but if placed in a proper medium, and afforded heat and moisture, it ramifies in all directions amongst the soil or other substances favourable to its growth. When the spawn begins to run, as it is termed, it may be propagated to a great extent. The spawn may be safely exposed to a temperature of 80°. Proof of this is afforded by the fact that, if inserted in Melon-beds, it increases or runs in a temperature of 80°; and when the crop of Melons is ripened off, the beds cleared and sufficiently watered, and the temperature lowered, a crop of Mushrooms springs up.

Light is not essential for the growth of Mushrooms, for, although they grow naturally in open

above-ground occurs chiefly in the night. The Mushroom is of course exposed to light during the day, and that may be of importance in per-



Fig. 1220.—Mushrooms (*Agaricus campestris*)

fecting the spores; but in other respects light is not essential. The Mushroom makes in the open pasture the bulk of its substance in the night, and even the salmon-coloured tinge of the gills is acquired in the dark.

Mushrooms, like other species of Fungi, abound in nitrogen; this substance must therefore be considered a necessary element of their nutrition, and unless substances rich in nitrogen are supplied, their cultivation cannot be attended with success. Nitrogen is found in considerable quantity in the dung of horses and cows, and accordingly these substances are generally employed in the cultivation of the Mushroom. They are subjected to fermentation, but this evidently must not be carried too far, otherwise the nitrogen would be driven off in the form of ammonia. The substances from which the Mushrooms derive their principal supply of nourishment require to be coated with some earthy material, so as to absorb the ammonia which would be driven off by fermentation; they must also be rendered compact by treading or beating, in order that the fermentation may be rendered slower, and consequently more lasting.

Preparation of the Spawn.—For the artificial production of Mushrooms, good spawn is necessary. Brick spawn (fig. 1221), so called from the materials being worked up and cut or moulded like bricks, is made as follows: Fresh horse-droppings, cow-dung, and a little loam are mixed

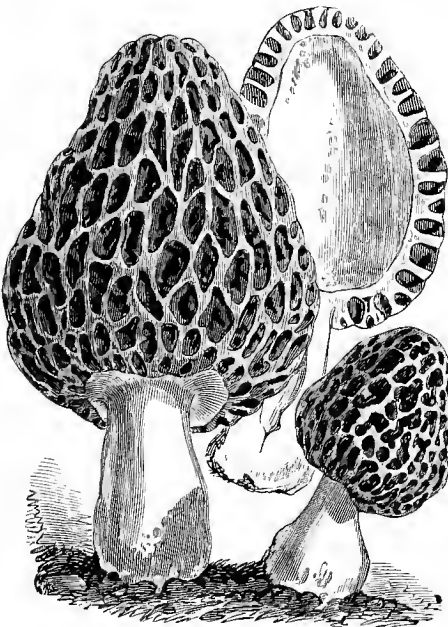


Fig. 1219.—Morel (*Morchella esculenta*). Mature and young specimens.

pastures, and dislike moist shady situations in which many other species of Fungi abound, yet it will have been observed that in those pastures the development of the Mushroom

and beaten up with as much stable-drainings as may be necessary to reduce the whole to the consistence of mortar. It may then be spread on the floor of an open shed, and when somewhat firm it may be cut into cakes of 6 inches square, placed on edge in a dry, airy place, and frequently turned and protected from rain. When half dry, make a hole in each with a dibber, so as to admit of about 1 inch square of good old spawn being inserted so deeply as to be a little below the surface; close it with some moist composition similar to that of which the bricks were formed. When the bricks are nearly dry make, on a dry bottom, a layer 9 inches thick of horse-dung, prepared as for a hot-bed, and on this pile the bricks rather openly. Cover with litter, so that the steam and heat of the layer of dung may circulate among the

of horse, cow, and sheep's dung. Analyses of these are of course subject to variation; but those made by Boussingault, and other eminent authorities, may be considered a fair estimate of the percentage of nitrogen which the substances in question usually contain, and this is exhibited in the following table:—

SOLID EXCREMENTS.			URINE.
	Fresh.	Dry.	
Horse.....	0.54	2.2	1.55
Cow	0.32	2.3	0.44
Sheep	0.72	1.7	1.31

From the above it appears that in the solid excrements of the horse there is rather more than one-half per cent of nitrogen, in that of the cow scarcely one-third per cent, while in that of the sheep there is nearly three-fourths per cent. The amount of nitrogen in dried horse and cow dung is nearly equal, and about one-fourth more than in dried sheep's-dung. The urine of the horse, it will also be seen, yields a large amount of nitrogen.

Although horse-dung contains a greater amount of ammonia, and ferments more readily than cow-dung, yet the heat of the latter continues longer, and on this account a mixture of the two may be employed for the growth of Mushrooms.

Some recommend these substances to be used in a fresh state, others after they have undergone a considerable degree of fermentation. In the latter state, much of their nitrogen must have been driven off in the form of ammonia, so that there is no question as to the superiority of the fresh materials, if the heat generated by such can be controlled; but this is the difficulty. They can be disposed in thin layers, but then they do not afford such good produce as when in a greater mass. It may here be observed, that firmly beating the materials tends to lessen the fermentation, and by boring holes the heat is permitted to escape, but likewise the ammonia, which it would be desirable to retain for the benefit of the crop. Therefore, whilst the fermentation is going on, the beds should be covered with loam, by which much of the ammonia will be absorbed. For the same purpose a little leaf-mould might be spread over the surface of the dung, and then about 2 inches thick of loam, or of a compost of loam and cow-dung which has been frequently turned, and

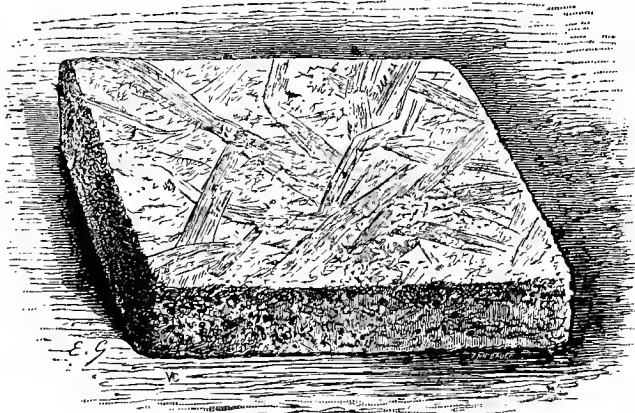


Fig. 1221.—Mushroom Brick Spawn.

bricks. The temperature should not rise above 60°. The spawn will soon begin to run, and when, on breaking a brick, the spawn appears throughout pretty abundantly like a white mould, the process has gone far enough. The bricks should therefore be removed, allowed to dry, and then be kept in a dark dry place. As there is so much difference of opinion as regards the substances employed in making spawn-bricks, and as different combinations of them are successfully employed, it will be worth while to endeavour to ascertain whether there is not one common principle in all of them, which is more especially essential for the growth of the Mushroom. The quantity of nitrogen which it contains being much greater than in other plants subjected to cultivation, it follows that this element must be abundantly supplied; and accordingly all the substances usually employed for the spawn to feed upon contain nitrogen in considerable quantity, as in the case



MUSHROOMS IN A CAVE

the different substances thoroughly mixed and incorporated.

The proper temperature can be maintained in pits during winter much more easily than in the ridges; but on the latter, Mushrooms are still extensively cultivated by the market-gardeners near London. Their mode of proceeding is very simple. The ridge is formed of dung fresh from the London stables, and prepared by being thrown into long narrow heaps and turned as often as the centre of the heap becomes hot. It is ready for use after about a fortnight of this treatment. The beds are formed on a hard piece of ground, and are 3 feet wide at the base, and are brought up to a very narrow ridge at top, to which the sides form a steep slope. The dung is made compact, and covered with mats or long litter to keep out the wet, and bits of spawn are inserted 6 or 8 inches apart when the heat is declining below 80°. The sides are beaten as closely as possible, and the whole is then covered about 2 inches thick with a fine adhesive loam, and beaten with the back of the spade, so that it becomes a compact casing to the bed. Formerly it was the practice to water this surfacing of soil and bring it to the consistency of mortar, but these plastered surfaces invariably shrink and crack, breaking the Mushroom threads wholesale. The heat is regulated more or less by the thicker or thinner covering of mats or litter, and if likely to become too cold, the bed is covered with warm litter. It should not be allowed to cool more than is proper, and then be warmed up by hot dung. Care must be taken to protect the beds from rain, for if they were allowed to get too wet the spawn would not run, and for this purpose long litter, mats, or tarpaulins are usually employed.

Mushrooms can be obtained in abundance for a good part of the year from beds formed out-of-doors as above described, but the uncertain state of the weather occasions much more labour in regulating the covering than is required in growing them in a house where they are not exposed to extremes of heat and cold, and dryness and moisture.

A Mushroom-house may either be span-roofed, or with a lean-to roof. A width of 10 feet is good, with a path 3 feet wide, and a bed 3½ feet wide on each side. If the north wall were built hollow, it would the better resist sudden changes of external temperature, and the same would be the case with the roof if it were covered with a thick coat of thatch, either straw or heath; but thatch, except in particular situations, is un-

sightly, besides being dangerous in case of fire; consequently slates will be chiefly employed instead, although in sunny weather they become hot, and transmit much heat to the interior. It will therefore be advisable, in the case of the Mushroom-house, to have a double ceiling. The interior should be filled up with brick shelves, having in front upright ledges 9 inches deep, and 2 feet ought to be allowed from the bottom of one shelf up to that of the one next above it. Moisture is readily diffused through bricks, so that if their outside is moist from vapour in the air of the house, their inner surface in contact with the materials of the bed will not be injuriously dry.

Where brick shelving has been tried the crop of Mushrooms has proved much superior to those on wood; and this being the case, the question is only one of expense as regards the first outlay.

Although for the greater part of the year a well-constructed Mushroom-house will not require fire-heat, yet, in severe winters, it is necessary to have it at command. A little will suffice,

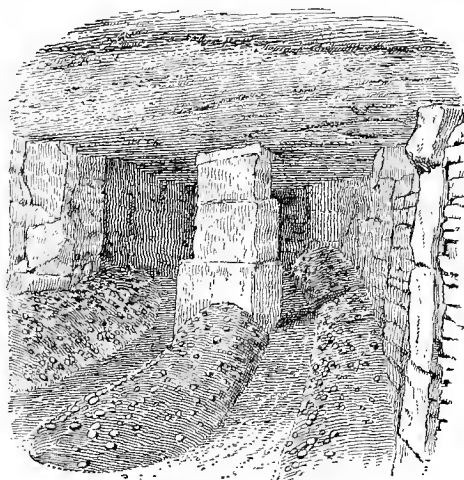


Fig. 1222.—Mushroom Cave in Paris.

especially as the doors should be made to shut closely, and the windows ought to be furnished with close-fitting shutters. A small hot-water apparatus, with a flow and return 3-inch pipe, will answer the purpose. The pipes can be laid either in a channel under the footpath, where they can be covered with a grating or wooden trellis; or they may be placed along each side of the path, and saddled with movable evaporating troughs, made either of iron, tinned or galvanized, or of earthenware. If more vapour should at any time be required than will rise from these troughs, some of them may be re-

moved, and the hot-water pipe watered through the rose of a watering-pot. A dense steam can be still more readily produced by means of an inch pipe fitted into the top of a small boiler, which may be placed in an adjoining shed or other convenient situation.

The materials chiefly employed for beds indoors, and in pots or boxes, or on shelves, is the droppings of horses fed on corn and hay. They should be collected fresh, and laid in thin layers or small ridges in a dry place. The long litter ought to be shaken out and dispensed with; but a portion of the short litter may be retained, provided it has been well moistened by the urine of the horses. These materials should be frequently turned and maintained in an incipient state of fermentation until the rankness is got rid of. In order that the ammonia may not be lost, the dung may be mixed with a little rather dry friable maiden loam. The manure should be distributed evenly in layers and the beds made firm; they should be about a foot deep at the back and an inch or two less in front.

The late Mr. Forsyth recommended horse-droppings to be collected and dried a little in an open shed, a stratum of loamy turf 2 or 3 inches deep to be placed in the bottom of the bed, and then three layers of droppings, each layer being rendered as compact as possible. When the mass heats, holes are bored 9 inches apart and as deep as the loam, and when the heat declines to 80° the holes are partly filled up with loam and horse-droppings mixed; a piece of spawn about the size of a hen's egg being inserted in each, they are then filled up level with the surface. If the beds are to be of considerable thickness, say 1 foot or more, then it is well to mix the materials with loam in order to prevent the fermentation becoming too violent; but when they are chiefly composed of droppings they must be made thinner, in which case they will not continue so long in bearing.

The spawn should be in lumps 2 inches square; these are placed 6 or 8 inches apart a little below the surface when the heat is 75°, or on the decline from 80°, a temperature which the materials ought never to exceed. In this and all other instances, trial sticks or plunging thermometers ought to be used. On the least signs of vapour being unduly confined, holes should be opened to let this out, otherwise injurious overheating will result. Pointed iron rods are sometimes needed for boring holes through the centre of ridge-shaped beds. When it is seen there is no likelihood of overheating taking place, soil over at once, the surface of the bed to be

covered thinly with loam, and in a week or ten days this covering should be made up to 2 inches thick. When put on it ought to be as warm as the materials of the beds. The whole is then covered with hay or litter.

The temperature of the house should be kept at between 60° and 65° till the Mushrooms appear; afterwards it may be from 50° to 55°. When in bearing, the productiveness of the beds is sometimes injuriously affected by excess of water. When moisture is needed it is best to well moisten the covering of hay and litter, but not the beds themselves. The water used for this purpose must be of the temperature of 80°.

Always twist off the Mushrooms, and when possible remove the solid mass of roots at the base, filling up the holes thus caused with fresh loam. When cutting is resorted to, the old stumps decay rapidly, and quickly cause masses of mould or fungus to appear, which in their turn destroy all the Mushrooms, large and small, they come into contact with.

Mustard (*Sinapis alba*).—A hardy annual, a native of Europe, including Britain, where it is found in fields and waste places. The white Mustard is only used, generally along with Cress, as a salad, for which purpose it is cut while in the seed-leaf stage.

It is raised from seeds, which may be sown every week or ten days throughout the year, either in the open ground or in heat, according to the season. The sowings in the open ground may be commenced about the middle of March, and given up about the middle of October. The ground where it is to be sown should be light, rich, and raked very fine; for the early and late sowings a warm spot should be selected; for those made in the heat of summer, a shady situation must be chosen; at other times any open compartment with good soil will do. It should be sown thickly, in shallow drills 6 inches apart, and only slightly covered with earth, after which the surface should be pressed smooth with the back of the spade, so that there may be no roughness to interfere with the cutting. With the exception of watering the seed-bed and the young plants in dry weather, no further culture is necessary. In gathering, the plants are cut over by the ground; if allowed to remain they will put forth leaves a second time, but those first produced are greatly to be preferred.

Forcing.—The seeds of Rape are largely substituted for those of Mustard. The seeds to be forced ought to be sown very thickly in shallow boxes or square pans, on the surface of quite

fresh, previously moistened soil, pressing it into the surface rather than covering with fine soil. Place in any structure where a temperature of from 55° to 70° is maintained, or on an old hot-bed. Cover with either brown paper or mats, and do not withdraw these till the stems are an inch in length, afterwards gradually exposing to the light. In this manner only is it possible to have the long well-blanching stems, such as market-growers know are needed, and which private gardeners too often fail to produce. On no account use stale soil, or that which has been previously used for a similar purpose, as this is almost certain to end in feeble growth and wholesale damping. On a large scale, the seeds may be sown on good fine soil, rotten tan or leaf soil, in any place where the necessary amount of heat, light, and moisture is at command.

To keep the seedlings free from grit, which is not easily washed off when preparing them for the table, it is a good plan to spread a piece of thin canvas over the soil and sow the seeds *on* the canvas, which is easily kept moist, and on which the seeds germinate readily, their roots easily gaining access to the soil and developing long stems which may be cut off close to the canvas, and be so clean as to not require washing.

Nasturtium, or Indian Cress (*Tropaeolum majus*).—A native of Peru, where it is a perennial, but it is treated as an annual here. The leaves, young shoots, and flowers are frequently eaten in salads. The flowers are used as a garnish. The young flower-buds, leaves, and fruits, gathered when green, are pickled in vinegar, and employed instead of capers, which they somewhat resemble in flavour, and to which many persons consider them preferable.

The plants succeed best in a light rich soil, with a warm aspect. They are raised from seeds sown in March or April, 4 inches apart, in drills 1 inch deep. They may be staked like climbing Peas.

The tuberous Nasturtium (*T. tuberosum*) (fig. 1223) is a South American climbing or trailing



Fig. 1223.—Tuberous Nasturtium (*Tropaeolum tuberosum*).

perennial, with fleshy Potato-like tubers coloured bright orange mottled with red. When boiled they have an agreeable flavour, but they require to be carefully cooked to be palatable. In South America, where these tubers are a well-known and favourite dish, they are boiled and afterwards frozen before being eaten. They have been tried in Covent Garden Market, but they have never found favour here.

New Zealand Spinach (*Tetragonia expansa*) (fig. 1224).—A hardy annual from New



Fig. 1224.—New Zealand Spinach (*Tetragonia expansa*).

Zealand, whence it was introduced in 1772 by Sir Joseph Banks. Though inferior to Spinach it forms a good substitute for that vegetable, especially in the hot dry months of summer, when the common Spinach runs so quickly to seed, that even with frequent sowings it is sometimes impossible to gather a good dish. On the other hand, the New Zealand Spinach, under the same circumstances, always produces, when properly cultivated, an abundance of succulent leaves.

It is raised from seeds, which should be steeped for twenty-four hours before sowing. It should be sown in March on a gentle hot-bed, placing the seeds 3 or 4 inches apart. When the seedlings have grown to the length of 2 or 3 inches, they may be lifted, and planted singly in small pots, which should be placed under a frame till the middle or end of May, when the young plants may be planted out. This should be done in a light rich soil, with a southern aspect. The distance between the plants in the row may be 3 feet, and between the rows from 4 to 6 feet. If planted on a border sloping towards the south, the plants should not be less

than 18 inches from the path, as they will incline to grow most in that direction. Water should be given at planting, and afterwards all the care they will require is confined to watering frequently in dry weather. In gathering, the young tops and leaves should be pinched off; abundance of fresh ones are produced throughout the summer and autumn. Seeds may be saved by placing a plant or two in poor soil, in lime rubbish, or by training them against a wall. In warm seasons, however, it ripens its seeds in the open ground.

Onion (*Allium Cepa*).—A hardy biennial, a native of Central or Western Asia. The Jews had a city called Onion, built by Onias (B.C. 173), near the Gulf of Suez, which existed for 243 years, and it is not improbable that this vegetable, long used among the Egyptians and Jews, may have obtained in comparatively modern times the name which, with little variation, in this and other European countries, it still retains.

The uses of the Onion are universally known, and few plants have such a wide range of cultivation; for it is grown from the tropics to the coldest verge of the temperate zone. The leaves and roots are of an annual nature, inasmuch as they die in the course of a single summer after perfecting a bulb; the latter, however, is biennial, and after a temporary rest it has the power of emitting new roots, pushing fresh leaves, and sending up a flower-stalk. In some cases it also forms offset bulbs.

Soil.—Onions succeed best in an open situation, in rich loam. Good crops of Onions may also be obtained from soils of very different texture and quality, with the aid of suitable manures, and by judiciously varying the modes of cultivation, according to circumstances. For the spring crop, the ground should be ridged up before winter as roughly as possible. It should not be disturbed in wet weather, nor whilst it is saturated with moisture; but when it is so dry that its lumps will crumble rather than stick together, it cannot be too much worked.

If the soil is light, it should, in the first place, be finely dug, to ensure an equal looseness throughout, in order that, by subsequent treading and rolling, it may be rendered uniformly compact. In such soils, good crops are obtained in wet seasons, but it is not merely the quantity that has to be taken into consideration, the quality, in such seasons more especially, is of still greater importance. If Onions are not well ripened, they cannot be expected to keep

soundly, and of course they will become better ripened in dry light soil, in a cold wet season, than in soil of a contrary description. If circumstances will permit, it is advisable to grow a portion of the crop on warm and rather dry

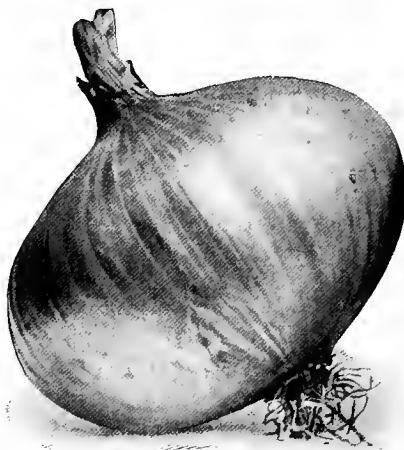
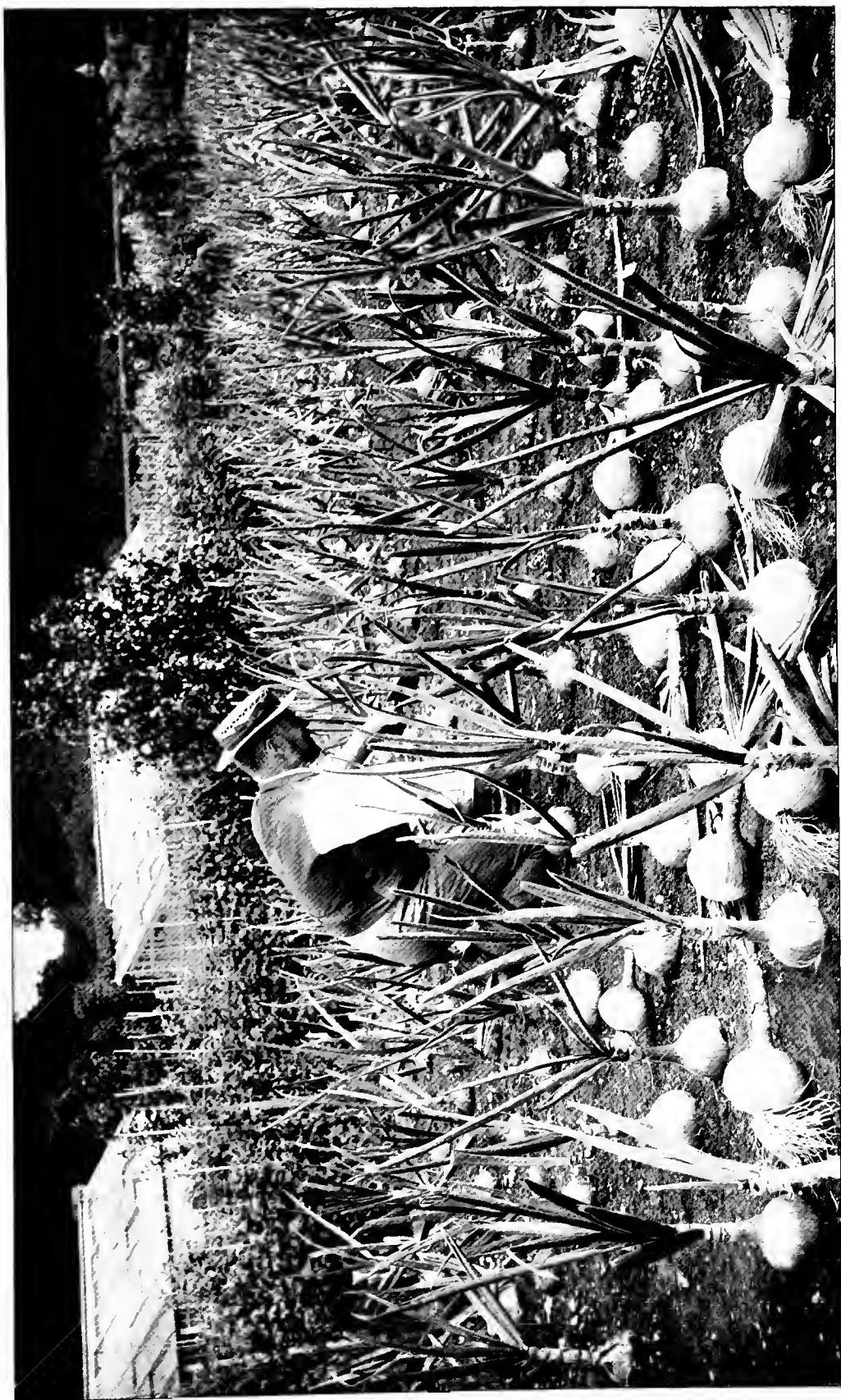


Fig. 1225.—Onion—Sutton's A 1.

soil, calculated to yield comparatively sounder produce than can be obtained from ground that is cold and wet. The soil should be well drained. If the subsoil is too retentive, the ground should be sub-trenched. When this is done there will be a free passage for air and moisture throughout the soil.

Manures.—Pigeons' dung has long been very generally employed as a manure for Onions, and it is one of the best. The dung of poultry, of sheep, and well-decomposed night-soil, are also excellent. Well-decomposed farmyard manure, if used fresh in large quantities for the preceding crop, or turned into the ground before winter and thoroughly mixed with the soil previous to sowing, answers well. Guano may be used in the form of a liquid manure. Superphosphate of lime is good, especially in moist seasons, and where the soil is damp; and so is bone-dust. Salt, soot, and lime are useful as manure, and also for preventing the attacks of the Onion maggot and other insects. Charcoal is sometimes sprinkled along the drills with the view of preventing canker. Wood-ashes and charred rubbish are good along with other manures. The market-gardeners near London sow salt and soot along with the crop, and their crops of Onions are generally very fine.

Spring-sown Onions.—The precise time of sowing the main crop cannot be stated, for it greatly depends on the state of the weather and the nature of the soil. From the middle of



ONIONS

February to the middle of March is the usual period; but should the ground be either frozen or covered with snow, or saturated with rain, then the first opportunity should be seized. In bad springs or in very cold situations the beginning of April would not be too late.

The ground having been rendered friable, it should be dug over in the end of February or early in March, in small spits the full depth of the spade but narrow, each spit to be thoroughly broken before another is turned over. The ground should not be made fine merely on the top, leaving the rest of the spit in coarse lumps, but the whole must be thoroughly broken.

If the soil is light it should be trodden or rolled; and heavy soil should also be lightly rolled, if rather dry at the time, but not otherwise. In cold low-lying positions the ground may be marked off in 4-foot beds, with 1-foot paths between. The drills should then be drawn 8 inches apart, or 12 inches for the large sorts. As a rule the plan of sowing quite on the level and in drills 12 inches apart answers well, and is much the simplest. In order to have well-formed sound-keeping Onions, the seeds cannot be too near the surface, so long as they are just covered. The seeds, if good—and this ought to be previously ascertained—should be sown thinly along the drills, then covered with a little finely-broken soil, and trodden, smoothed with the rake, or rolled with a roller of greater or less weight, according to the nature of the soil, for the lighter it is the more it should be pressed. In many cases a roller may not be at command; if so, the surface of the bed should be pressed with the back of the spade.

Instead of drawing drills, the line may be stretched, and a round straight rod, about $\frac{3}{4}$ inch in diameter, laid alongside of it, then by treading or otherwise pressing down the rod, a groove of uniform depth, smooth and firm at bottom, will be formed. In this the seeds can be regularly sown, and covered with a little mould. The advantage of this system is that all the seeds will be near the surface, whereas when drills are drawn in the ordinary way, some seeds drop into holes, and from being too deeply buried are apt to produce thick necks.

After sowing, weeding, thinning, and watering are all that is necessary till the crop is mature or nearly so. It will be observed that the plant does not come up with an erect point, but is doubled like a whip, and as it advances in growth the point gets clear of the soil. Very soon after this takes place the surface of the ground should be hoed in order to cut up all seedling weeds,

and at the same time the Onions should be thinned with a small 2-inch-broad hoe. The first thinning ought to be partial in case of failure. Hoeing and weeding should be repeated as often as may be necessary. Although the surface of the soil should be hoed in order to destroy weeds, and although the growth of the young plants may be promoted by the shallow stirring requisite for that purpose, yet the deep loosening of the soil, so beneficial for many crops, is not so for Onions. The best-formed and soundest bulbs are grown where the surface is rather firm than loose. It has frequently been observed that where the soil of the beds has been loose, the best Onions were those which sprung from seeds accidentally dropped on the paths.

The final thinning should be to the distance of from 4 to 6 inches in the row, according to the richness of the soil and the size which the variety attains. If very large Onions are required, the drills may be 15 inches asunder, and the plants thinned to 9 inches in the row; and if the seeds are sown broadcast, each plant should be allowed from 5 to 8 inches square. When the weather is dry, watering in some cases is beneficial till the tops acquire a good size; but when there appears a disposition to form thick necks, a slight check from drought will assist in the formation of bulb, as also will twisting the necks so as to cause the tops to fall over.

When the foliage begins to flag and the stems to bend, it is a sign that they have performed their part as regards the growth of the plant, and the first spell of dry weather should be seized to pull up the bulbs; after heavy rain it would not be desirable to do so till several dry days have elapsed. But whatever may be the state of the weather, care should be taken to pull up the Onions before a second growth commences. Some idea of how Onions should be treated will be obtained from fig. 1226, reproduced from a photograph. If wet weather should prevail, the best plan is to take the crop up, and lay it on a dry surface, sheltered from rain, but exposed to air and to whatever sunshine there may be. Onions when pulled are usually laid on the ground with their roots towards the south, in order that the sun's rays may assist in withering them. They should be turned over on a dry day, and when the surface of the ground is dry. In private gardens it is sometimes possible to lay the Onions on a dry gravel walk, or some other hard surface, and this is preferable to the cultivated ground. Anyway, they must be thoroughly harvested, if necessary, in a dry heat

or the floor of a vinery cleared of fruit. When the roots and tops are completely withered the greater portion of the latter should be taken off, and the bulbs may then be stored in a dry cool place. They keep very well in a loft above an open shed, secured, however, from frost by a covering of straw, and a lining of the same material round the walls. They also keep well strung together by their necks on a straw rope, and suspended

so as not to touch the walls of the place in which they are stored. Onions have been known to keep well till late in the spring by storing them several feet thick in a cool loft, without disturbing them till finally removed for use.

Onions for Pickling.—White Spanish or Reading, Silver-skinned, Early Silver-skinned, and Nocera, are sorts specially recommended for this purpose; but the Silver-skinned varieties



Fig. 1226.—An Onion Crop.

are preferred for their finer appearance in pickle-jars and at table. As security against failure some of each of these may be sown in March. The ground should be rather poor than rich, and not manured. The seeds should be sown thickly, covered very slightly, and well rolled. Thinning is not required except where the plants have come up too close together.

If seeds of Onions are sown in spring, the plants cultivated so as to attain a fair size, and taken up when mature and replanted in the following spring, they push fresh roots, flower, seed, and then die; but if sown in autumn, they will survive ordinary winters, and develop into large bulbs in the course of the following spring and summer. If an early sort be sown thickly in not very rich soil in the beginning of May, small bulbs will be matured sufficiently well to keep through the winter; and in conse-

quence of having been sown late, and from being of small size, they will not be disposed to run to seed when replanted in spring, and their vegetation not taking that direction, the small bulbs become very large. It thus appears that very large Onions result from two seasons' growth, as is the case when the small bulbs of one year's growth are planted in the spring of the next, or when a growth made in autumn is continued in the following spring and summer. In Portugal, Onions do not require to be sown so early in the autumn as in Britain; but they are forwarded in a little heat in November and December, and thus make a considerable growth before the spring-sown Onions are above-ground. From having this advantage, they swell to a much larger size than those sown in March, and which have consequently a much shorter period of growth; for, whether sown in autumn, or

early or late in spring, the Onion has a disposition to rest after the hottest period of the summer is over.

In order to have extra fine Onions to come under the designation "spring-sown", exhibitors sow seeds of the finest varieties of the White Spanish type in pans of good soil, and place them in a moderate heat early in February. Not being raised thickly no thinning or pricking out is needed, but the plants are kept growing sturdily near the glass in gentle heat till large enough to plant out, when they are hardened off and a favourable time selected for dibbling them out on extra-well-prepared ground where they are to grow. This plan has been adopted on a large scale in America, as it is found to be the surest method of securing an even crop of extra-fine, perfectly-matured bulbs, such as completely eclipse any sown in the open in the ordinary manner.

Autumn Sowing.—If the plants are not to be transplanted in spring, seeds of the White Spanish, or of the Silver-skinned, should be sown about the 17th of August. The seeds

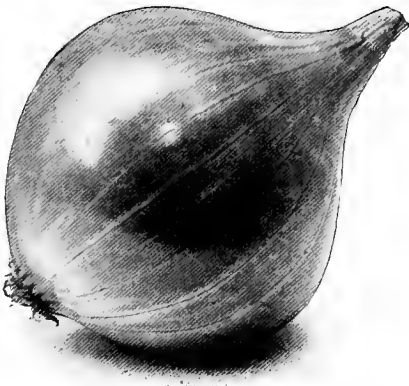


Fig. 1227.—Onion—Perfection.

require to be covered to a greater depth than those sown in spring, otherwise they are liable to be thrown out of the ground by frost; on this account, in sandy soils an inch deep will not be too much. The plants should be thinned if necessary.

If intended for transplanting in spring the White Spanish or Reading and Tripolis should be sown early in September, and transplanted in spring into ground prepared as for the spring-sown crops. The plants should be carefully removed from the seed-bed, in order that their roots may be preserved as entire as possible. The ground having been prepared, let a line be stretched, and the surface made smooth and close by beating with the spade, lightly if

the ground is rather moist and strong, more heavily if light and sandy. Next cut by the line a small trench, and if some good compost can be spread in the bottom so much the better. Then, with the plant in one hand, place the roots so that the fibres only shall be under the surface. The fibres should then be spread out and covered with soil by hand. When the row is planted, and the soil levelled, the latter should be made even, and rendered moderately compact with the back of the spade. If Onions for drawing young are likely to be in demand, the plants may be put at half the distance in the rows at which the crop is to remain, and every other one taken out for early use.

Planting Small Bulbs of the Preceding Year's Growth.—These are obtained by sowing seeds of White Spanish or Reading, about the 10th of May, in dry, rather poor soil, in the manner directed for sowing pickling Onions. If the weather be dry, give a good watering immediately after sowing, but no more. Let the bulbs be taken up when ripe, and when perfectly dry they may be kept in paper bags, in a cool place, till the beginning of February, when, if the weather permit, they should be planted in rich soil, 4 inches apart in rows 9 inches asunder; or 6 or 8 inches apart in rows 1 foot from each other, if very large bulbs are desired. The bulbs should be taken between the finger and thumb, and pressed a little way into the ground. If there should be any small Onions they may be planted in the same way.

Offset Onions.—By sowing thickly in April, and allowing the plants to remain without thinning, bulbs of small size will be produced. Those of the size of Walnuts, or still larger, should be planted in January or February, pressing the bulb into the ground so as scarcely to cover it. When the stem begins to shoot up to flower it should be broken off, and in consequence of the check to the growth in this direction young bulbs, known as "scallions", form round or out of the old ones. Onions 2 or 3 inches in circumference, and fit for the kitchen, may thus be obtained at a time when spring-sown Onions are not larger than quills, and Onions thus thrown into clusters will be full grown and fit to take up by the end of June. They do not keep; but this, we may add, is of no great consequence, as their principal use is to afford a supply between the new and old crops.

Potato Onion.—This is generally planted as early in the spring as the weather will permit, but it may be planted in December, especially

if the bulbs then begin to push. The ground should be deep, rich, and well prepared; the bulbs should be planted almost on the surface, and in rows 15 inches apart, and about 10 inches from each other in the row. In Devonshire, where this Onion is much cultivated, the

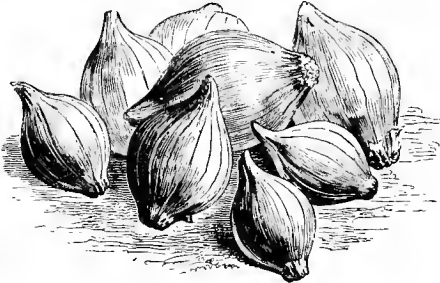


Fig. 1228.—Potato Onion.

rule is to plant on the shortest day, and to take up the crop on the longest. They plant in rows 1 foot apart, and place the bulbs at 6 inches from each other in the rows. The winters in Devonshire are mild, but in parts of the country where this is not the case, early spring planting is to be preferred.

Egyptian Onion.—This may be propagated from the bulbs formed in the ground; also

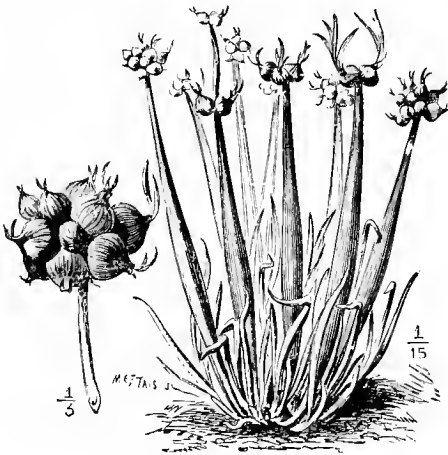


Fig. 1229.—Egyptian Onion.

from the small bulbs formed on the stem. The former are planted 1 foot apart each way, in shallow drills, about the same time as the main crop of Onions is sown in spring, and the stem-bulbs in the beginning of April, 4 inches apart, in rows 8 inches asunder. Stems that bear heavily require to be supported. When mature, the stem-bulbs should be gathered, dried, and kept in a cool dry place.

It is attempted to grow Onions in almost

every cottage-garden, in some, or indeed in many of which, the soil is not well adapted for this crop; yet it is important to the cottager that he should be able to raise a supply. We may therefore give some of the modes of cultivation by which difficulties in the way of raising good crops on indifferent or even poor soils have been overcome, and from which some useful hints may be obtained. The following method, of which the peculiar advantage is, that good Onions may be obtained by it on a very moderate soil without the abundant supply of manure which broadcast sowing requires, was recommended by Mr. James:—

The seeds are sown on a slight hot-bed in the second week in March; the plants, when up, are exposed to the air whenever the weather permits, and in the last week in April they are planted out in the following manner:—Deep drills are made on a piece of well-dug ground, 15 inches asunder, and the drills are filled with a good compost of equal parts of sandy loam and rotten dung; the plants being drawn carefully from the beds, are placed in these drills at 12 inches distance from each other, their fibres only being covered with the mould, and the entire bulb kept above-ground. When planted, they receive a gentle watering, which is continued daily, unless rain falls, till the roots have got hold of the compost. They are afterwards hoed when necessary, and occasionally watered, till they are fit to take up. By sowing Onion-seed on a good south border in the second week in September, the plants, if of a hardy variety, will stand the winter, and they may be treated in the spring as above described, with the same success as if they had been raised on a hot-bed.

Forcing.—When young Onions are required in winter for salads, the seeds may be sown thickly in pans or boxes of light rich soil, placed near the glass in a vinery or other structure where a temperature of from 55° to 65° is maintained. The Onions are drawn for use in a very young state, and a sowing may be made every fortnight if a constant succession is required.

To save Seeds.—For this purpose select some of the largest and best-formed Onions when the crop is taken up. Plant them either in November or February, in warm soil, and in a situation well exposed to the sun, but sheltered from wind. In planting, drills should be formed 3 or 4 inches deep, according to the size of the bulbs. These should be planted in perfectly straight rows, 1 foot apart and 6 inches

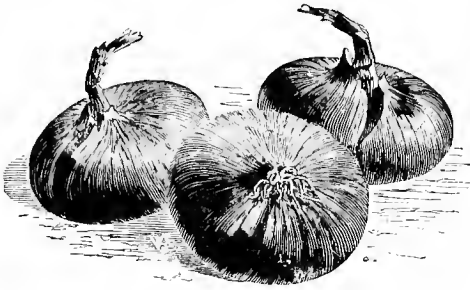


Fig. 1230.—Onion—Blood-red.

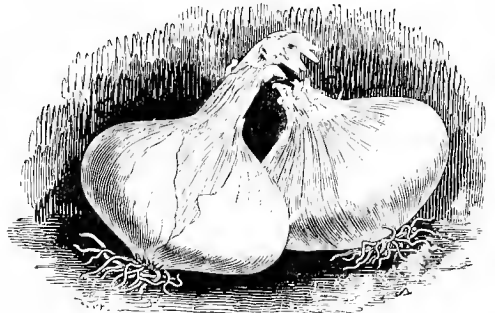


Fig. 1231.—Onion—Silver-skinned.



Fig. 1232.—Onion—Giant Rocca.

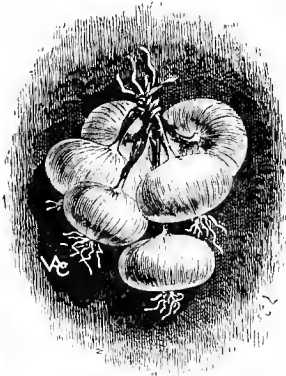


Fig. 1233.—Onion—Queen.

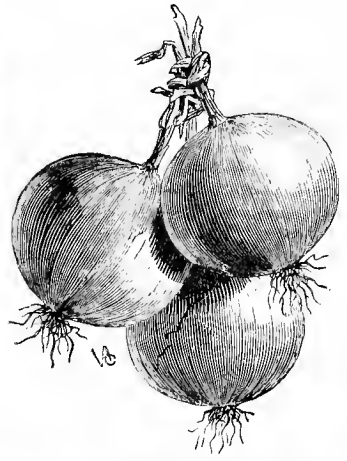


Fig. 1234.—Onion—Yellow Danvers.

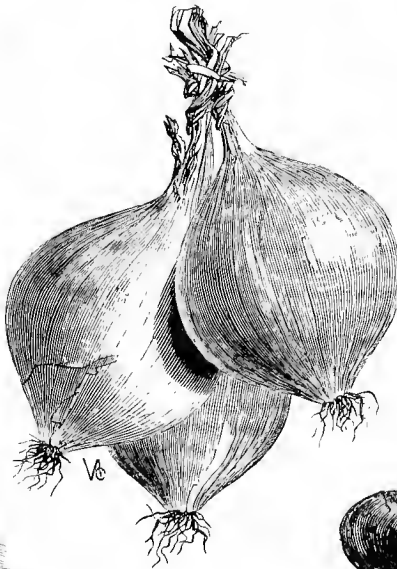


Fig. 1235.
Onion—Trebons.

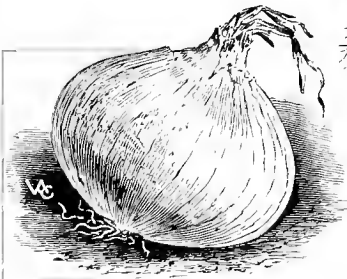


Fig 1235 — Onion — Lisbon.



Fig. 1237.—Onion—White Spanish.

asunder in the row. Instead of drills, the bulbs may be planted in holes made by the dibber. The flower-stems require support as they advance in height. Stakes should therefore be driven in, and tarred cords stretched horizontally on each side of the row of stems. In August or September, when the seeds are ripe, the stalks should be cut over by the ground and laid on a cloth in the open air for a few days to dry; but during this process the seeds ought not to be exposed to rain. The seeds keep good for two years, seldom longer.

Insects, &c.—See chapter on this subject.

Root Enemies.—Brassy Onion Fly, Millipedes, Onion Fly, Wireworms.

There are many varieties, all more or less subject to variation, so that if shades of difference were taken into account, names would be uselessly multiplied. It is necessary, however, to distinguish the sorts that are early or late, large or small, mild or strong, and such as keep only a short time or till late in spring. The principal of these are:—

Ailsa Craig.—This remarkable Onion holds the record for weight both as single bulbs and in groups of one dozen or more, namely, 3 lbs. 7½ ozs. for a single specimen, and 37½ lbs. for one dozen roots. It is of more value for exhibition than for use.

Bedfordshire Champion.—One of the best and most popular of the large globe Onions. In shape it resembles James's Keeping, but is paler in colour and milder in flavour. One of the most reliable, and a good keeper.

Blood-red (fig. 1230).—Middle-sized or rather large, flattish; skin dull-red, the coating next below it glossy and very dark-red; flesh very firm and solid, white; the internal layers palest at the base, and, except at the top, only coloured on their outsides; each layer is paler than the one which surrounds it till the centre is reached, which is white. Strong in flavour, and a late keeper.

Brown Globe.—Medium-sized, globular or obovate with a high rounded crown; skin reddish-brown; flesh pale throughout, or sometimes in rather darker-skinned forms having a slight shade of red as an outside coating to the various layers. An excellent and much-esteemed keeping variety. *Magnum Bonum* is a fine form of this.

Brown Spanish.—Medium-sized, flattened or oblate, regular and even in form, with a small neck, of free growth, very hardy, and ripening early; skin dark reddish-brown; flesh firm and solid, tinged with red. A good keeper of excellent quality. *Strasburg* and *Deptford* are forms of it.

Egyptian (fig. 1229).—When the flower-stalks of this Onion are allowed to run up, they become viviparous, small bulbs about the size of marbles being formed at the top instead of flowers. A few offset bulbs are also formed under-ground, and by these, but chiefly by the little bulbs on the stem, the variety is propagated. The stem-bulbs are excellent when pickled.

Improved Reading.—A maincrop Onion of excellent shape and mild flavour. An exceptionally good keeper, remaining sound after other varieties have decayed.

James's Keeping.—Large, pear-shaped; skin brown; veins purplish-red; flavour strong. Much esteemed for its long and sound keeping qualities.

Lisbon (fig. 1235).—Large, globular, the neck rather thick; skin smooth, thin, clear and white. A late but hardy sort; if sown in August it affords a good supply of young Onions for spring salads; or if transplanted from the autumn-sown beds in April, large bulbs will be formed towards the end of summer.

Madeira (fig. 1238).—Very large, roundish-obovate, with a thick neck; skin reddish-brown, the layer under it pale-red. A soft mild Onion, which does not keep long.



Fig. 1238.—Onion—Madeira.

but on account of its large size and mild flavour it is deserving of cultivation for early use.

Perfection (fig. 1227).—An ovate solid Onion which attains a very large size, and is suitable either for spring or autumn sowing, but the finest results are obtained from the latter. Skin yellow, flavour excellent, keeps well.

Potato (fig. 1228).—This forms a number of bulbs on the parent root beneath the surface of the ground, and by means of these it is propagated, and in this way an abundant supply may be ensured, even in seasons when the sorts usually raised from seeds either wholly or partially fail. Or, if other kinds do not keep well, as is frequently the case, the Potato Onion will afford a supply before the others are fit. The bulbs are of average size, somewhat irregular, with a loose reddish-brown skin; flesh tolerably firm and solid, and of fair quality. It is very prolific.

Queen (fig. 1233).—Forms bulbs as quickly as a Radish, is a two- or three-leaved form of Silver-skinned, with small round white bulbs, and is probably the same as *Nocera*, as introduced thirty years since, an Onion which is apt to degenerate into a larger and coarser form under cultivation in this country.

Rousham Park Hero.—A large handsome variety of the Spanish type. A favourite for exhibition.

Silver-skinned (White Egyptian, Early Hard Dutch) (fig. 1231).—Bulb roundish-oblate; skin thin, white and shining; the layer beneath of a beautiful clear white, striped with fine green lines; flesh pure white, firm, and solid. Much esteemed and cultivated for its mild quality, and for pickling.

Sutton's A 1 (fig. 1225).—Midway between Improved Reading and Globe; the skin is brownish-yellow in colour, and the bulbs keep sound for an extraordinary time. Seed may be sown both in spring and autumn. Two very fine specimens of this Onion weighed 2 lbs. 13 ozs. and 2 lbs. 5 ozs. respectively.

Trebons (fig. 1236).—Large, obovate, with a rather gross neck, the skin pale-straw colour, peeling off readily; flesh pale and soft, but of mild and good quality. A large and handsome early autumn sort, allied to White Spanish and Yellow Danvers, but does not keep well.

Tripoli.—Very large, tapering sometimes abruptly from the middle to the neck, and almost equally so to the root; colour beneath the skin pale brown-red, tinged with green. It is of a soft nature, and does not keep long, but is much esteemed on account of its mild quality. *Giant White Tripoli* is a flat pure-white form. It attains a very large size if sown early in autumn and transplanted in spring. *Giant Rocca* (fig. 1232), with very large roundish-obovate bulbs, appears to be another fine form of Tripoli. One form is straw-coloured or light-brown, and the other deep-red and very mild flavoured. By sowing in autumn and transplanting, bulbs of $3\frac{1}{2}$ lbs. have been grown.

Veitch's Main Crop.—A fine variety of the Improved White Spanish type. It is very quick in growth, and when fully developed attains a large size and heavy weight, having a great depth of bulb, being high in the shoulders and full at the base; the bulb is smooth and solid, and of a beautiful pale-straw colour. Generally grown for a main crop; also proves an excellent keeper.

Welsh Onion (*Allium fistulosum*) (fig. 1239).—This is quite distinct from the common Onion, inasmuch as it never forms a bulb; its roots are long and tapering, with



Fig. 1239.—Welsh Onion.

strong fibres, and its stems and leaves are hollow. Its principal use is to furnish young Onions for salads early in spring. There are two forms, the white and the red.

Wethersfield Red.—Large, flattened or oblate, very even and regular; skin dull-red, peeling off freely, the inner coating light-purplish; flesh pure white. Of mild excellent quality, and a good keeper. The finest of all the red Onions.

White Spanish (fig. 1237).—Very large, flat; skin loose, pale-straw, falling off and exhibiting a greenish-yellow coating; veins not tinged with red; flesh firm and solid, almost white, and of excellent quality, with a mild flavour. Keeps good till March; one of the best for early winter

use. When grown in autumn and transplanted in spring, it attains a very large size. The Banbury and Nuneham Park forms of it are specially good.

Yellow Danvers (fig. 1234).—Allied to White Spanish; bulb middle-sized, roundish-oblate, firm, with a very slender neck; skin dark straw-yellow, not loose and exposing the flesh. A very fine variety and a good keeper.

The following is a classified list of the Onions exhibited at a Vegetable Conference held by the Royal Horticultural Society at Chiswick in September, 1889:—

(a) FLAT. Type—*Anglo-Spanish*. Colour, yellow to brown.

Anglo-Spanish.	Nuneham Park.
Anglo-White-Spanish.	Ronsham Park Hero.
Banbury.	Sandy Prize.
Brown Spanish.	Strasburg.
Danvers.	Sulphur Yellow.
Danvers Yellow.	Sutton's Improved
Deptford.	Reading.
Giant Zittau.	Veitch's Maincrop.
Globe Danvers.	White Spanish.
Market Favourite.	Yellow Vertus.

(b) GLOBE OR ROUND. Type—*Ailsa Craig*. Colour, yellow to brown.

Ailsa Craig.	James's Keeping.
Bedfordshire Champion.	New Paramatta.
Brown Globe.	Pinesfield.
Cocoanut.	Southport Yellow.
Cranston's Excelsior.	Trebon's White Globe.
Golden Ball.	Wroxtton Improved.
Improved Pinesfield.	

(c) TRIPOLI. Flat and Round.

Advancer.	Large Giant Rocca.
Giant Late White.	Large Round Madeira.
Giant Lemon Rocca.	Madeira or Globe.
Giant Rocca.	Red Italian.
Golden Globe.	St. Laurent.
Large Blood-red Italian.	Yellow Rocca.
Large Flat Madeira.	

(d) WHITE OR SILVER SKIN. Type—*Queen*.

American or Southport.	Selected White.
Carter's Silver Ball.	Silver Skinned.
Early White Naples.	White Lishon.
Queen.	

(e) BLOOD-RED. Flat and Round.

Black Douglas.	Red Champion.
Blood-red.	Southport Red Globe.
Dobbie's Red.	

Orach, or Mountain Spinach (*Atriplex hortensis* (fig. 1240).—A hardy annual, native of Tartary. The leaves are used as a substitute for Spinach, and to correct the acidity of Sorrel. The plant will grow well in any soil; but the leaves are largest and most succulent in rich soils. The seeds may be sown any time from the end of February to September in drills 2 feet apart, thinning out the plants, when 3 or

4 inches high, to 20 inches apart in the row. Or they may be sown broadcast in a small bed, and the young plants transplanted to the above distances. A sowing in March, and one in June,



Fig. 1240.—Orach (*Atriplex hortensis*).

for succession, will in general prove sufficient; but if in constant demand it must be sown more frequently, for it soon runs to seed. Where seeds are not to be saved the flowers should be pinched off, as the seeds are very light and easily carried by the wind; they should be gathered before they are ripe, and dried and shaken out upon a cloth. There are three varieties, namely, white, green, and dark-red.

Oxalis crenata (fig. 1241).—A tuberous-rooted plant, a native of Peru, where it is cultivated under the name of “Oca”. The tubers, which are produced in great abundance, seldom

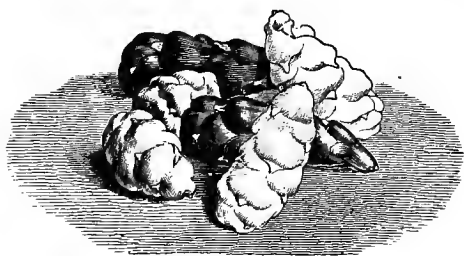


Fig. 1241.—*Oxalis crenata*.

exceed the size of a hen's egg. They are covered with a smooth skin, and have numerous eyes, by which the plant may be propagated.

They possess a somewhat acid taste, which

is rather disagreeable; but it may be removed by adding a little carbonate of soda to the water in which they are boiled.

According to Mr. Weddell, the Oca is extensively cultivated in the temperate parts of Bolivia, where several varieties are distinguished. It is sometimes to be found in green-grocers' shops here, but the slightly acid flavour of the tubers is disagreeable to some persons. This acidity may be converted into a sugary flavour by exposing them to the sun, which converts the acid into saccharine matter. This phenomenon is analogous to what goes on at the ripening of most fruits. The Oca, when treated in this way, loses all trace of acidity, and becomes as floury as the best varieties of Potatoes. It should be exposed to the sun from six to ten days. In Bolivia this operation is performed in woollen bags, which appear to facilitate the conversion of the acid. To obtain this result the bags should contain no more tubers than are sufficient to form a thin layer within the bag. If the action of the sun is continued for several months the Oca becomes of the consistence and sweet taste of dried Figs; the tubers are then called “Cauí”. They are cooked by steam, being placed on a bed of straw, which keeps them from contact with the water over which they are cooked. In Bolivia, and more especially at La Paz, the Oca is cultivated to double the extent of the Potato. The price is also twice as high as that of the last-named vegetable.

The plant requires a light rich soil and a warm situation. It is propagated by sets like the Potato, or by cuttings, which easily take root. The sets should be planted on a hot-bed in March, and planted out in May, 2½ feet apart, in rows a yard asunder.

According to Mr. Maund, the mode of culture which is likely to cause the greatest production of tubers consists in laying the stems, and covering them with light rich mould as they proceed in growth, leaving only perhaps 6 inches of the end of each shoot out of the soil. A similar course is recommended by M. Guesnet, who states that the earthing up should be commenced when the shoots are about 4 inches in length, and continued till September, when the tubers begin to form. These may be allowed to remain in the ground till late in autumn, or till the stems are cut down by frost, when they should be taken up and preserved in sand in a dry place throughout the winter.

This plant being easily killed by frost, it is only in warm seasons that tubers are formed in

England, although abundance of foliage is produced.

Parsley (*Apium Petroselinum*). — A hardy biennial, a native of South Europe. It appears to have been known to the ancients as a medicinal plant, and in the Middle Ages Charlemagne included it among the plants which he ordered to be cultivated in his gardens. It is said to have been cultivated in England in 1548.

Parsley is extensively used in stuffings, for flavouring soups and stews, and as a garnish. The Fool's-Parsley (*Æthusa Cynapium*), a poisonous plant belonging to the same natural order as

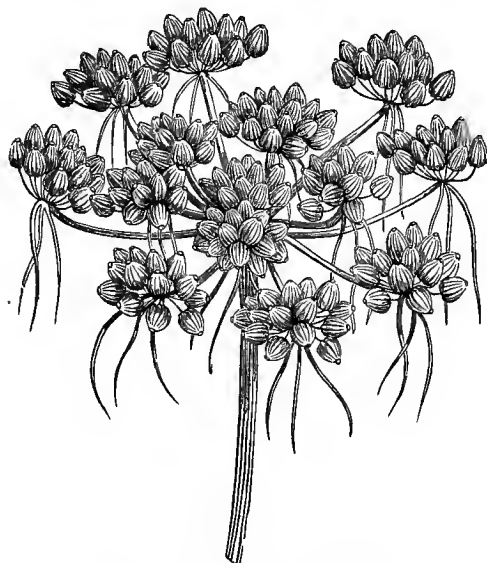


Fig. 1242.—Fool's-Parsley (*Æthusa Cynapium*).

the true Parsley, bears considerable resemblance to the plain-leaved variety of the latter, and dangerous mistakes sometimes occur in consequence. When eaten it produces nausea, numbness, and insensibility, and in some cases even death. It may, however, be readily distinguished from Parsley by the unpleasant smell of the leaves when bruised, by their being of a much darker green, and of a different shape. It is further and more certainly known by having three long narrow leaves hanging down from one side of each of the partial umbels, as in fig. 1242.

Parsley requires a good but not too rich soil, and a somewhat shady situation. It is raised from seeds, which may be sown any time between February and the end of August. A sowing in January or February, another in April or May, and one in July for winter and spring use, will

in general suffice. The last sowing should be made at the foot of a south wall, and the plants ought to be covered with hand-glasses in frosty weather.

The seeds should be sown in drills 1 foot apart, and covered with fine mould to the depth of about $\frac{1}{2}$ inch. They usually take several weeks to germinate. In dry weather the seed-bed should be frequently watered; and when the young plants are sufficiently strong they may be thinned out, first to 3 inches apart in the row, and afterwards, when rather further advanced, to 6 inches from each other. Parsley is frequently grown as an edging, but in this way, wherever there is much traffic, the leaves are liable to get bruised and dirty. In gathering for use, the largest and best leaves are picked off singly. When the leaves become old and no longer tender, the plants should be cut over, and fresh ones will be produced. This may also be done in autumn as a preparation for a winter supply. In frosty weather some plants should be protected with fern or litter.

Parsley transplants readily, and this admits of a considerable number of strong plants being lifted with their thick tap-roots intact, and replanted somewhat thickly in pits or frames in the autumn, or they can be placed in deep boxes or large pots, and in either case be well protected from severe frosts and be gathered from during the winter. The finest curled or "double" strains are more tender than the old strains, and are liable to be destroyed wholesale by severe frosts. If from this or other causes there is likely to be a failure in the supply in the spring and early summer months, prepare a gentle hot-bed in a pit or on a frame, on this place 6 inches of fine loamy soil, sow the Parsley seeds broadcast, and cover with $\frac{1}{2}$ inch of sifted soil. Keep close till the seedlings are up, then give a little air. Thin out lightly, and when large enough thin out more freely, the thinnings being dibbled out on a warm border 12 inches apart each way to attain their full size, and give numerous gatherings of leaves far ahead of any plants that can be raised wholly in the open. Leave some of the plants in the pit or frame about 5 inches apart each way, and from these early and frequent gatherings of young leaves will be had.

In saving seeds, the plants with the most perfectly curled leaves should be selected, and transplanted into an open spot of ground by themselves. The seeds ripen in July, and preserve their vegetative powers for two or three years.

Hamburg Parsley (fig. 1243) is cultivated only for its edible fleshy roots. In order to have these large, the ground should not be too highly manured, but it ought to be deeply



Fig. 1243.—Hamburg Parsley.

trenched. The seeds are sown early in March, in shallow drills 1 foot apart, and the plants thinned out to 10 inches asunder in the rows. In October or November the roots, having attained their full size, are taken up and preserved in sand, or kept in earth in a border.

There are numerous named sorts of Parsley, but they differ only slightly from each other.

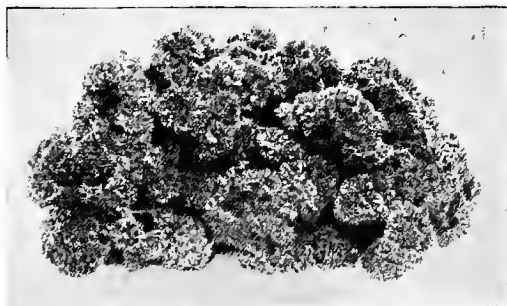


Fig. 1244.—Parsley—Dwarf Perfection.

Those most preferred have large very curly leaves, of which fig. 1244 is typical.

Parsnip (*Pastinaca sativa*).—A hardy biennial, native of Europe, including Britain. It is largely cultivated for its roots, which are very nutritious. A tolerable wine is also made from them.

The Parsnip succeeds best in a rich deep soil and an open situation; a free sandy loam is also well adapted for its growth. The ground should be trenched and manured if necessary in the autumn, as the addition of fresh manure just before sowing causes the roots to fork. The seeds should be sown thinly, in the middle of March, in shallow drills, 15 inches, or not

more than 18 inches apart. When the plants are about 2 inches high they may be thinned to 1 foot apart, or 15 inches if very large roots are desired. As a rule, medium-sized to comparatively small roots are preferred, these also being the least liable to canker. They can be had by leaving the plants 10 inches apart. With the exception of hoeing the ground, nothing further will be required till the leaves begin to decay in the end of October or beginning of November, when a portion of the roots may be taken up and stored in dry sand for use in frosty weather; but as they are always best when newly dug, the principal portion should be allowed to remain in the ground, to be taken up for use as required. The remainder may be taken up in February before they begin to shoot, and stored for use. These will keep till April or May in a dry cool place. The Parsnip-fork (fig. 1245) will be found very useful for taking up Parsnips, Carrots, and other roots.

If seeds are to be saved, some of the best roots should be carefully taken up and replanted 2 feet apart in a sheltered situation, where they will flower in July and ripen seeds in the end of August. Seeds more than one year old seldom germinate.

Insects, &c.—See chapter on this subject.

Leaf Enemies.—Cabbage Aphis, Cabbage Butterfly, Diamond-back Moth, Garden Pebble Moth, Silver Y-Moth, Turnip Fly, Turnip Saw-fly. *Root Enemies.*—Cabbage Fly, Cabbage Gall Weevil, Daddy Long-legs, Dart Moth, Field Mice, Millipedes, Pot Herb Moth, Wireworms, Yellow Underwing Moth.

The varieties of Parsnip are:—

Guernsey (Long).—An improvement on Student. The roots, which are long and tapering, sometimes attain the length of 3 or 4 feet.

Hollow Crown.—Leaves short; roots 18 inches long, 4 inches in diameter, hollow round the insertion of the footstalks, the crown generally below the surface of the ground. When well-grown they sometimes weigh as much as 5 lbs., and in quality they are excellent, being tender and of fine flavour. The best variety for general cultivation.

Student.—Roots 3 to 4 inches in diameter at the shoulder, thence tapering regularly to the depth of 20 or 30 inches. Crown generally below the surface of the ground.

Tender and True (fig. 1246).—Not quite so large as Student, but more perfect in form, the quality is the very best, and the skin beautifully clear and smooth. In the opinion of competent judges, this is the finest Parsnip in existence.



Fig. 1245.
Parsnip or
Root Fork.

Turnip-rooted.—Roots resembling a round Turnip, from 4 to 6 inches in diameter, and terminating in a strong tap-root. It is the earliest sort, and from the root growing principally above-ground, it succeeds well in ground too shallow for the other kinds.



Fig. 1246.—Parsnip—Tender and True.

Pea (*Pisum sativum*).—This should be known as the Garden Pea, to distinguish it from the Field Pea (*P. arvense*). The latter is grown largely for its haulm, highly esteemed as fodder, and differs from the Garden Pea in being hardier, purple-flowered, and in having brown-red or brown-speckled seeds.

The Garden Pea is an annual, with climbing slender hollow stems, and soft green pinnate leaves, terminating in tendrils which cling readily to bushes, &c., enabling the plant to climb. The stem varies in length from 6 feet or more, when it branches freely (fig. 1247), to about 9 inches (fig. 1248). The flowers, which are white and usually in pairs, begin to develop early, and fruits are usually abundant. There is much variety in the size and shape of the fruits (pods), and also in the seeds, which are either wrinkled or smooth, and cream-white or pale-green when ripe. It was cultivated for its edible seeds over two thousand years ago. Its botanical name, *Pisum*, is derived from Pisa, a town once famous for its Peas, and the popular name is from the same word—Pea, Peas, or, as Gerarde has it, "Peason". Its origin is unknown, beyond that it is probably Asiatic, and that it is certainly an introduced plant in Europe. Peas are said to have been an important crop in England in the eleventh century. "Before the introduction of the Potato, Peas were largely eaten by the working-classes, and a food so rich in nitrogen was doubtless the cause of the superior muscular development among the peasantry. So important was this crop held to be, that in the letting of a farm

the proportion of 'Siddan' land (Pea land) was always taken into consideration."

According to Gerarde there were numerous varieties of Peas in cultivation in England in the latter part of the sixteenth century. In 1710 mention is made in Salmon's *Herbal* of the following "Pease":—Early or Fulham, Green and White Hastings, Rounceval, Grey, Spotted, and "Peas without skins".

The eve of the nineteenth century was an important era in the evolution of the Garden Pea. In 1787 Mr. Thomas Andrew Knight, President of the Royal Horticultural Society, made some experiments in crossing different forms of Peas, including one, "a white Pea, which possessed the remarkable property of shrivelling excessively when ripe". From these he obtained Knight's Green and White Wrinkled Marrow Peas. Writing in 1817, he said, "The Pea which I have always planted for autumnal crops is a very large kind, of which the seeds are much shrivelled, and which grows very high: it is now very common in the shops of London, and my name has, I believe, been generally attached to it. I prefer this variety because it is more saccharine than any other, and retains its flavour late into the autumn." This was Knight's Tall Wrinkled Pea, afterwards sent out as British Queen.

In 1850, Dr. Maclean of Colchester commenced to cross-fertilize Peas. He raised numerous first-rate sorts, which were distributed by Turner and Veitch. Among them was Veitch's Perfection, which has held its place ever since as one of the best medium-height wrinkled Peas in cultivation. Without doubt it is a descendant of Knight's Dwarf Green Wrinkled. Little Gem, also raised by Maclean, was the first very dwarf wrinkled Pea.

Other successful raisers of first-rate Peas were Mr. T. Laxton, Mr. Culverwell, and Mr. Eckford. Messrs. Sutton and Sons have introduced many excellent sorts of Peas, including Perfection, Late Queen, Excelsior, Centenary, &c. Messrs. Carter & Sons also have distributed many good Garden Peas, including Sherwood, Edward VII, Surprise, &c.

The cross-fertilizing of the flowers of Peas is an operation requiring much care, that is, if a cross is to be obtained, many supposed crosses being nothing more than the result of self-fertilization. The following directions were given by Mr. N. N. Sherwood in the *Journal of the Royal Horticultural Society*, vol. xxii (1898), to whom we are also indebted for some of the particulars above given:—

The flower of the variety selected as the seed parent should be secured some time before it approaches the opening stage, as, if not operated upon at the right time, it may become self-fertilized. Having selected the two varieties of Peas to be crossed, the operator carefully

fully dust with pollen the stigma of the seed-bearing blossom; when the viscid substance upon the stigma dissolves the pollen grains they pass into a tube below, the lower end of which is connected with each ovule contained in the ovary; and as the dissolved grains pass into the ovules fertilization is completed.

The operation thus performed, the operator carefully covers up the stigma with the petals of the flower to prevent contact by the elements, or by insect agency, &c., and the fertilized blossom is covered with a thin piece of muslin or cotton shading.

The act of crossing has been performed with marked success, and the changes thus brought about will manifest themselves in successive generations. Supposing a fertilized pod produces six seeds, and if each of the six seeds be sown and they germinate, and the produce of each of the six seeds be sown by themselves, it is pretty certain each row, though sown with seeds which are the produce of an undivided plant, would produce plants showing great diversity in habit of growth, earliness, and in the character of the pod and seeds. As a general rule, after reaching this point it is necessary to select the most promising plant in each of the six rows, and by succeeding selections fix the character of the particular variety. It very likely happens that the best type obtained from a particular cross is found in selections made in the fourth and fifth year after the cross was made.

CULTIVATION.

Soil.—For the main crop of Peas a rich friable loam is best, in the composition of which lime is a principal ingredient; and if the soil does not naturally contain a sufficiency of calcareous matter, the latter should be added to it in the shape of lime, chalk, gypsum, &c.

It should be deep, so that the roots may easily penetrate downwards to obtain moisture in time of drought, as, if the plants once get too dry after they have commenced to blossom, the pods never fill well. For early crops, and especially for the very earliest, a warm, rather sandy loam is desirable, because earliness rather than abundance is the desideratum. The ground in all cases should be well drained, and the sur-

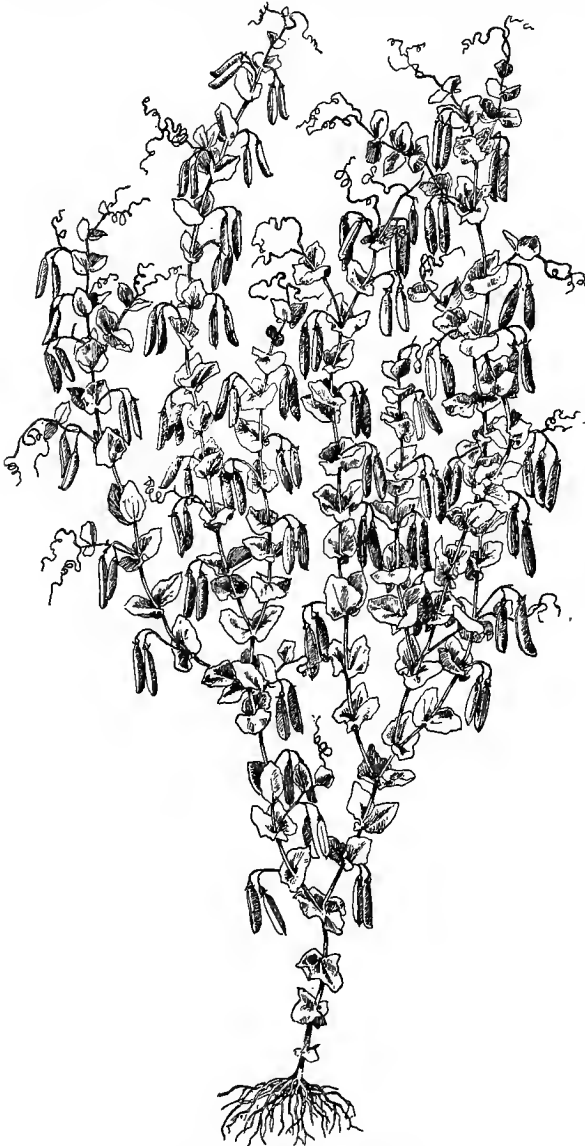


Fig. 1247.—*Pisum sativum*, tall form.

opens the undeveloped petals of the seed parent, removing delicately and carefully by means of forceps the undeveloped anthers upon which appear the pollen grains, but which at this stage are not active. The next process is to take the other bloom selected just as the pollen grains are maturing upon the anthers, and by the assistance of a fine camel's-hair brush care-

face should be kept so that the rain-water may pass through the soil.

Manure should be applied in greater or less quantity, according as the soil is more or less poor. In general, Peas are sown in ground that has been manured for a previous crop; but for the latest crop it is a good plan to trench the ground, putting a layer of rotten dung about 1 foot below the surface. For early crops horse-dung is preferable, and in moist situations it may be employed in a littersy state when only partially decomposed, so that it may act mechanically as drainage. When the soil has not been enriched for a previous crop, and is too poor for Peas, farmyard manure



Fig. 1248.—*Pisum sativum*, dwarf form.

can always be depended on. Blood is an excellent manure for Peas. It may be applied fresh and watered in, or in a dried state and forked into the rows.

With regard to artificial manures, the natural composition of the soil should be ascertained, and if possible substances of which it is deficient should be supplied. In calcareous districts it would, of course, be worse than useless to add lime, chalk, or gypsum; but these substances will, on the contrary, be highly beneficial in all soils where they only exist in very limited quantity. Some artificial manures act injuriously when they are in immediate contact with the germinating seed, and the seed itself doubtless affords the best nourishment that can be given, and till that is exhausted, or nearly so, stimulants of any kind must be either superfluous or injurious. Guano, however, has been found to answer well when mixed with the soil in the bottom of the drill, and then covered with $1\frac{1}{2}$ or 2 inches of soil. When at this distance from the pushing embryo the latter cannot be injured by the manure, and the radicle, when it approaches it, is strong enough to assimilate the nourishment thus afforded. Excellent crops have been obtained with guano

applied in a similar manner, and the haulm was shorter and stronger than where no guano was employed; but on Marrow Peas, which are naturally inclined to grow too luxuriant, the effect as regards produce was not so good.

The ground having been prepared, the first thing to be done is to mark the distances for the rows, and this will depend on the height of the variety, which again ought to be selected according to circumstances. Where the space is limited, or where tall sorts would injuriously shade other things, it may be advisable to select dwarf kinds, or at all events not very tall ones. It has been well ascertained that rows standing far apart yield the best and most abundant produce. Hence, some have them 20 or 30 feet apart or more, the intermediate space being occupied by other crops. The usual plan, however, is to make the rows from 3 to 6 feet asunder. The very dwarf sorts, not requiring sticks, such as Harbinger, Chelsea Gem, and Sutton's Green Gem, may be sown in rows 18 inches apart; and, as a general rule, the distance between the rows may be made equal to the height to which the variety usually grows. The vigorous-growing dwarf Marrows require more space than the slender-growing kinds. Duke of Albany, Alderman, Goldfinder, and Ne Plus Ultra should have not less than 6 feet of space between the rows, unless space is very limited, and then the distance may be a foot or so less, taking care, however, to top the plants when $5\frac{1}{2}$ or not more than 6 feet high.

FIRST EARLY PEAS.

For early Peas, the best direction for the rows is east and west. This would be lengthwise along a south border; but it is generally more convenient to sow across the border, and if it be done obliquely from south-east to north-west, the ridge of soil drawn to the roots of the plants will have the sun's rays nearly direct on its broadside when they are hottest.

For the main crops in the open quarters it is best to sow the rows from north to south. The average depth of the drills should be 2 or 3 inches for small sorts, and 4 inches for the large kinds. Instead of drawing the drills so as to form a triangular furrow, make them wide and flat at bottom, say 7 inches wide, or at all events not less than 6 inches; the roots will thus have room to grow without being crowded, and without robbing each other of nourishment and moisture.

The seeds are often sown too thickly; on the

other hand, some direct them to be placed as much as 3 inches apart. This, however, can only be recommended when the object is to have as much increase as possible from some particular sort. The seeds should be tried previous to sowing, and allowance made for the proportion of it that either fails, or germinates so weakly as not to be reckoned upon. Early sorts, if the seeds are good, may be sown at the rate of a pint for a row 50 feet long. Late

strong kinds, such as the tall Marrows, may be allowed for 70 or 80 feet per pint.

When the seeds have been sown, the soil raised in forming the drill should be made fine and drawn over the seeds, and trodden lightly, or rolled if not wet.

As soon as the plants are a few inches above-ground a little earth should be drawn towards the lower part of the stem, but so as to press very little against the foliage. As the plants



Fig. 1249.—Pea—Chelsea Gem.

advance, some more soil should be drawn towards them. Sorts that require support should then be immediately staked, for it is unwise to allow the plants to grow till the haulm bends. By the time the tendrils appear, the sticks should be in readiness for them to lay hold of, and then they will keep the haulm straight, which is more than can be effected by any propping up after it has been bent. For sorts that do not require stakes, the soil should be drawn more against one side of the row than the other. This will incline all the haulm to the opposite side. Were this not done, some plants would incline one way and some the other, and get into confusion with those in the adjoining rows. It is better to incline the plants when young, than allow them to grow to some considerable height, to be blown over by the wind.

Peas for market are generally grown in open fields entirely without stakes, medium-height sorts being preferred. The seeds are sown thinly in lines 2 to 2½ feet apart. When the plants are high enough they are simply moulded up as for Potatoes. In this way good profitable crops are obtained.

Earliest Crops.—It was formerly an aim in Pea culture to have the first gathering as early as the 4th of June, the birthday of George III. But by various modes of forwarding and protecting, new Peas are obtained much earlier in ordinary seasons. To have them, however, in the first week in June is early enough when means are limited. There may be a south sheltered border at disposal, in which the first sowing for an early crop may be made about the middle of November, choosing, of course, the earliest sorts, and enough of each to afford

a dish, by taking the one or two most forward pods on each plant.

As a protection from mice, the seeds should be planted deeper than is usual for summer crops; but the nature of the covering should be lighter. The young plant will push its way through a considerable depth of soil without injury. The seeds as soon as sown may be covered with some good soil, and then with several inches of sand. The sand would be easily enough worked by mice, but it forms too unstable a roof for their burrows, and by falling in renders their mining operations in vain. Chopped furze has been employed, but it is not quite effectual; for mice live snugly enough under furze bushes where old fallen prickles abound. Moistening the seed and then rolling it in powdered red-lead is by far the best preventive of mice attacks. It does not affect the germinating powers of the seeds, whereas petroleum is liable to do so, and, in addition, acts as a preventive for a short time only.

Before the young plants are well through the soil, it should be stirred and made fine, taking care in doing so not to injure them. When they are a few inches high the soil should be drawn against them, and they ought to be sheltered by sticks, stronger, and placed closer together, on the north than on the south side. On the latter, indeed, the sticks should be as thinly set as is consistent with preventing the plants from falling, till their tendrils can lay hold of the more substantial sticks, intended for both shelter and support. In quarters, and sometimes in borders, the ground for early-sown Peas is thrown up in ridges, the bases of which are equal to the distance which the variety would require between the rows, if sown on level ground. Their height may be 2 feet above the bottom; the latter should be made lower at one end than the other, in order that water may not collect in it. In this way the roots of the plants will be free from excessive water; whilst the Peas, being sown about half-way up the slope, will be sheltered by the upper part of the ridge. If the weather and state of the ground permit, another sowing should be made in January, still choosing a warm sheltered situation.

Early dwarf Peas are occasionally sown in the shelter of walls; but it is better not to do this if any other means can be adopted, because the Peas interfere with the performance of operations necessary for wall-trees. The wooden pales of any enclosure, not immediately con-

nected with the garden, may be taken advantage of, and various other means of shelter may be devised. In case of severe frost it is a good plan to mulch the Peas with litter, leaves, or other substances that will prevent the ground from being frozen.

Sowing in Pots.—Where pots can be spared for the purpose, they afford a very convenient means of forwarding an early crop, as they can be easily moved from place to place, and exposed to air and light. Various modes of sowing in pots have been recommended. Some dispose the seeds in a circle by the side of the pot, and in planting out, the ball is opened so as to allow of the circle of Peas being extended along the drill. In this way the plants started in an 8-inch pot would occupy nearly 2 feet of row. We, however, prefer pots about 3 or 4 inches in diameter. In these the seeds should be sown equally, but not too thickly, and reared in a house or frame, but in all cases near the light, till the weather is fit for them to be planted outside.

Mild weather should be chosen for this operation, and it would be desirable that the wind should be in the south-west, for in that case there would be little danger of frost at night. If turned out of the pots, and planted by means of a trowel, with the balls entire and about 1 foot apart, and the plants immediately staked, the latter will fan so as to fill the rows better even than if the balls were broken and extended so as to meet each other in the drill. A few spruce branches may be stuck in on the northern side for additional shelter. The plants should be earthed up in the usual way, and stopped above the third or fourth flower.

Turves are sometimes substituted for small pots, and early Peas also move well out of large flat boxes in which they have been raised thickly. They may be shaken out and planted in deep narrow trenches, much as box edging is planted.

The Parisian market-gardeners sow in the beginning of November, in frames, placed on a border with a south aspect. They allow about $1\frac{3}{4}$ pint of seed to 52 square feet, and this produces plants sufficient for six or eight frames of that area. The seeds are covered very slightly; the sashes are put on, and when the plants have begun to push they are covered with a thin layer of fine earth. In the course of December the frames into which the young plants are to be transplanted are prepared, and the ground inside is dug out so as to be 18 inches below the sashes, the earth removed being placed against the outside of the frames. After

this the ground on the inside is dug, levelled, and raked, and four drills 3 inches deep are drawn lengthwise in each frame at equal distances; but a greater space should be given between the first row and the front of the frame than that allowed between the rows themselves, because that part is naturally the dampest.

As soon as the young plants are 4 inches high they are taken up without breaking the roots, and planted in patches of three or four, placed 8 inches asunder in the row. During frost the sashes are covered at night with straw-mats, and air is given whenever the weather is sufficiently mild. When the Peas are 9 inches high all the stems are inclined towards the back of the frame, and to keep them in this position a little soil is drawn to their base. When they come into blossom they are pinched above the third or fourth flower to make them fruit sooner.

Whenever the sun has sufficiently warmed the ground, water is given, but only very sparingly till the plants begin to pod, otherwise a too vigorous growth, which would be detrimental to the crop, would be the result. Usually plants thus treated produce pods fit for gathering in the first fortnight in April.

Although every possible care may have been taken to protect winter-sown Peas from accidents, the ravages of mice, birds, and other enemies, it frequently happens that the rows have many blanks; it is therefore a good plan to sow some in a frame for the purpose of filling up vacancies.

In the climate of Britain it rarely happens that the temperature is not above freezing point during some period of each day in winter; and Peas, when the plants are young, will bear several degrees of frost without injury. They may, therefore, be forwarded in any place where they can be protected at night, and that will be sufficient. They should be exposed to the open air and light on every favourable day for at least a short time to maintain the foliage in a green state, and induce a daily advance in growth.

If frames are not at command, turf-pits could in many cases be formed with rods or slender poles laid to support thick straw-covers, fitted so as to be easily rolled up or unrolled. Or the seeds might be sown in large pots, a branched twiggy stick, as tall as the plants are intended to be grown, being at the same time firmly inserted in the centre of the pot. Instead of this stick, Mr. Wilson employed moderately

strong willows, inserted at the sides of the pot, with courses of small twine run round the willows and at 6 inches apart. The advantage of this mode is, that the plants can be kept in the pots till the produce is obtained, and previous to that they can be moved to where there is light and a sufficient amount of heat. Peas, when young, will not bear forcing till they are out of bloom and the pods set; then they will bear it and be forwarded by it.

MAIN CROP AND LATE PEAS.

The sowings for the main crops should be made in March, April, and May, at intervals which must vary according to the variety employed and other circumstances. Many sow for succession when the previous sowing appears above-ground; but this rule should not be made absolute. For example, a sowing made when the weather is very favourable for vegetation, and on the first appearance of the previous sowing, will almost overtake it, and thus form too close a succession. If sorts are employed that do not naturally form a succession, the sowings will require to be made at intervals of a fortnight or three weeks. The periods which the respective varieties require from the time of sowing till they come into bearing varies, of course, in different seasons and localities, so that the only way by which a correct knowledge as to those which will naturally form a succession can be acquired is to try the different varieties, and note the order in which they become fit for use, and then it will be easy to regulate the sowings so as to keep up a succession. By selecting proper sorts, and adopting a suitable mode of cultivation, Peas may be obtained until late in autumn.

The soil should be well and deeply trenched, and if dry it should be thoroughly moistened, particularly the lower portion of it, otherwise the crop is apt to mildew. The ground being so far prepared, shallow trenches should be dug out as for Celery, and some good rotten dung laid in the bottom. Part of the soil turned out of the trench ought to be scattered over the dung, then a layer of dung and soil mixed; finally, a layer of soil without manure, and in that the seed should be sown. The best sorts for a late crop are the Wrinkled Marrows. In warm soils and situations these may be sown in the second or third week in June; but in the northern parts of the kingdom the first week will be as late as they will blossom and form pods in any quantity. The tall sorts for late produce should

be topped when 4 feet high, and again when 6 feet. Harbinger and Chelsea Gem may be sown as late as the middle of July to afford a late supply, as they form pods in a shorter period from the time of sowing than the Marrow kinds.

The plants raised from these sowings should be earthed up and staked in the usual way, and care should be taken that the roots are supplied with moisture. If the air be hot and dry, the drain of moisture from the soil by the roots will be very great, so that before one is aware the soil is dry, and then the plants must suffer. If once too dry the evil cannot be effectually remedied, whereas it may be easily prevented by timely watering. If the weather continue dry, a good mulching with dung and leaf-mould will be very beneficial.

It is not natural, however, for Pea-seeds to germinate in the hottest period of the season, and then to have to grow, flower, and form seeds under a great decline of temperature. They succeed best when sown so that they may progress towards maturity with a rising temperature. Therefore it is probable that to obtain good late Peas with certainty would be to sow in pots in July, and keep the plants in a rather cool place till they had nearly advanced to a flowering state, and then remove them to a warmer situation, such as that in front of a south wall, where they could be protected if need be. In this way they would be kept comparatively cool during the early period of their growth; and although the heat would decline as they advanced to flowering, yet to them the effects would be in a great measure counteracted by a removal from a cool to a warm aspect, where the plants would be exposed even to an increase of temperature compared with that in which they had been reared.

To save Seeds.—In order to have well-matured seeds, the crop should be sown at the most favourable period for the uniformly progressive growth of the plant, and the best time for this is March. The very early sorts are more apt to be attacked by insects than later kinds, which are supposed to escape on account of their not coming into flower till the insect has changed. On this account it may be advisable, where early sorts are liable to be attacked, to sow them later, so that they may not come into flower when insects are abundant.

Insects, &c.—See chapter on this subject. Pea and Bean Weevils (*Sitona crinita* and *S. lineata*), Bean Beetle (*Bruchus granarius*), Pea Moth (*Endopisa proximana*), Birds, Mice, &c.

SELECTION OF VARIETIES.

Although the varieties of Peas are very numerous, reputed new ones are eagerly sought for. Whilst this is the case, new names will doubtless annually appear in the seed lists, though the varieties to which such names are applied may not be distinct from some already known. The most stable of varieties may be grown under particular circumstances of soil and situation, and may in consequence be altered in character, an alteration, however, of only temporary duration; yet this is sometimes seized upon as a "new break", and sent out under a new name.

The following selections include only those that are of proved first-rate quality:—

First Early, Dwarf.

Chelsea Gem (fig. 1249).—About 15 inches high. Pods usually in pairs of moderate length, slightly curved, containing five to seven seeds, which are wrinkled and of first-rate quality and flavour. Sown March 7, fit for use June 17. Very heavy cropper.

Excelsior (Sutton's).—About 18 inches high. Pods usually single, long and straight, containing seven to eight large seeds, which are compressed, wrinkled, and of first-rate quality. Sown March 7, fit for use June 16. Heavy cropper.

Green Gem (Sutton's).—About 15 inches high. Pods single, long, broad, and straight, containing seven to ten large seeds, which are very dark green, compressed, wrinkled, remarkably sweet, and of fine quality. Sown March 7, fit for use June 14. Heavy cropper.

Harbinger.—About 15 inches high. Pods usually single, long, straight, containing six to nine seeds, which are large, compressed, wrinkled, and of the finest quality and flavour. Sown March 7, fit for use June 11. Heavy cropper.

Pierremont Gem.—About 12 inches high. Pods usually single, large, straight, containing six to eight seeds, which are large, compressed, wrinkled, and of the finest quality and flavour. Sown March 7, fit for use June 19. Heavy cropper.

The Sherwood.—About 18 inches high. Pods usually in pairs, moderate length, straight, containing five to eight seeds, which are large, compressed, wrinkled, of fine quality and very sweet. Sown March 7, fit for use June 24. Very heavy cropper.

First Early, Tall.

Acme (Veitch's).—About 3 feet high. Pods usually in pairs, of moderate size; nearly straight, containing seven to nine seeds, which are large, compressed, wrinkled, of the finest quality and flavour. Sown March 7, fit for use June 28. Very heavy cropper.

Ameer.—About 4 feet high. Pods usually in pairs, large, curved, containing seven to ten seeds, which are large, compressed, round, of very good quality and flavour. Sown March 7, fit for use June 18. Extraordinary heavy cropper.

Bountiful.—About 4 feet high. Pods usually single, long, straight, containing six to nine seeds, which are large, compressed, round, of an excellent sweet flavour. Sown March 7, fit for use June 17. Very heavy cropper.

Duchess of York.—About 4 feet high. Pods usually single, large, straight, containing seven to nine seeds, which are very large, compressed, wrinkled, of the finest quality and flavour. Sown March 7, fit for use June 18. Heavy cropper.

Ideal (Sutton's).—About 3 feet high. Pods usually single, large, straight, containing six to nine seeds, which are large, compressed, wrinkled, of the highest quality and flavour. Sown March 7, fit for use June 9. Extraordinary heavy cropper.

May Queen.—About 3 feet high. Pods usually single, large, broad, and straight, containing five to eight seeds, which are large, very compressed, wrinkled, of first-rate quality and flavour. Sown March 7, fit for use June 9. Heavy cropper.

Second Early and Early Main Crop.

Centenary (Sutton's) (fig. 1250).—About 5 feet high. Pods usually in pairs, very large, straight, containing six to nine seeds, which are large, moderately compressed, wrinkled, of high quality and excellent flavour. Sown March 20, fit for use June 29. Heavy cropper.

Daisy.—About 2 feet high. Pods usually in pairs, large, straight, containing five to nine seeds, which are large, compressed, wrinkled, of fine quality and flavour. Sown March 20, fit for use July 2. Heavy cropper.

Duke of Albany.—About 5 feet high. Pods usually in pairs, long, large, straight, containing eight to ten seeds, which are large, compressed, wrinkled, of first-class quality and flavour. Sown March 20, fit for use June 27. Very heavy cropper.

Nonpareil (Sutton's).—About 18 inches high. Pods in pairs, long, broad, straight, containing five to six seeds, which are very large, compressed, wrinkled, of fine colour and sweet flavour. Sown March 20, fit for use June 27. Heavy cropper.

Prize Winner.—About 3 feet high. Pods usually in pairs, long, broad, straight, containing eight to eleven seeds, which are large, compressed, wrinkled, of the finest quality and flavour. Sown March 20, fit for use July 2. Very heavy cropper.

Stratagem.—About 2½ feet high. Pods usually in pairs, large, straight, containing seven to ten seeds, which are large, very compressed, wrinkled, of excellent quality and flavour. Sown March 20, fit for use June 30. Very heavy cropper.



Fig. 1250.—Pea—Centenary.

Main Crop and Late.

Alderman.—About 5 feet high. Pods usually in pairs, large, long, straight, containing eight to ten seeds, which are large, compressed, wrinkled, of very fine quality and flavour. Sown April 5, fit for use July 7. Very heavy cropper.

Autocrat (Veitch's).—About 4 feet high. Pods usually single, moderate length, containing five to seven seeds, which are large, very compressed, wrinkled, of the finest quality and flavour. Sown May 1, fit for use August 9. Very heavy cropper.

Captain Cuttle.—About 4 feet high. Pods in pairs, long, slightly curved, containing eight to ten seeds, which are large, compressed, wrinkled, of the finest quality and flavour. Sown April 5, fit for use July 12. Very heavy cropper.

Continuity.—About 4 feet high. Pods usually in pairs, long, straight, pointed, containing five to seven seeds, which are large, very compressed, wrinkled, of fine quality and flavour. Sown May 1, fit for use August 10. Very heavy cropper.

Edward VII. (Carter's).—About 3 feet high. Pods usually in pairs, long, straight, containing five to eight seeds, which are large, very compressed, wrinkled, of first-class quality and flavour. Sown April 20, fit for use July 30. Very heavy cropper.

Edwin Beckett.—About 4 feet high. Pods usually in pairs, large, straight, containing seven to nine seeds, which are very large, of fine quality and delicious flavour. Sown April 5, fit for use July 4. Very heavy cropper.

Goldfinder.—About 6 feet high. Pods in pairs, moderate length, containing five to seven seeds, which are very large, compressed, wrinkled, of the highest excellence in quality and flavour. This is a splendid selection of the well-known *Ne Plus Ultra*. Sown May 1, fit for use August 15. Heavy cropper.

Late Queen.—About 4 feet high. Pods in pairs, moderate length, straight, containing five to seven large seeds, which are compressed, wrinkled, of very good quality and flavour. Sown May 8, fit for use September 1. Heavy cropper.

Michaelmas (Carter's).—About 4 feet high. Pods in pairs, moderately short, containing five to seven seeds, which are large, compressed, wrinkled, of fine quality and flavour. Seeds sown May 8, fit for use September 5. Heavy cropper.

Ne Plus Ultra.—From 6 to 7 feet high, with a strong robust branching stem. Pods from twelve to eighteen on a stem, almost always in pairs, olive-green, very plump and full, containing from seven to nine very large seeds of first-rate quality. Sown May 1, fit for use August 15. One of the very best and most productive.

Peerless.—About 3 feet high. Pods usually in pairs, long, straight, containing six to nine seeds, which are large, moderately compressed, wrinkled, of good quality and fine flavour. Sown April 20, fit for use July 29. Heavy cropper.

Perfection (fig. 1251).—Height 3½ feet; a robust grower and a grand cropper. Pods in pairs, long, straight, containing nine or ten large compressed seeds of excellent flavour, and a dark-green colour when cooked. Sown May 1, fit for use August 25.

Sharpe's Queen.—About 3 feet high. Pods usually in pairs, large, straight, containing six to eight seeds, which are very large, compressed, wrinkled, of excellent quality and remarkably sweet. Sown April 20, fit for use July 27. Very heavy cropper.

The Gladstone.—About 5 feet high. Pods usually in pairs, long, nearly straight, containing eight to eleven seeds, which are very large, compressed, wrinkled, of

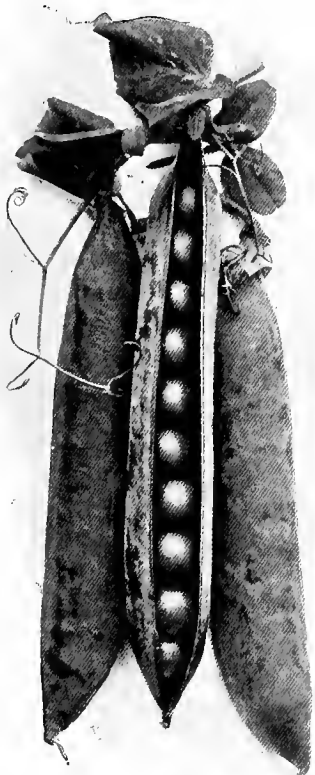


Fig. 1251.—Pea—Perfection.

superb quality and flavour. Sown May 1, fit for use August 8. Very heavy cropper.

The following selection was considered by Mr. N. N. Sherwood (of Messrs. Hurst & Sons) to be the leading varieties of Garden Peas in 1899:—

WRINKLED PEAS FOR GARDENS.

First Early.

Dr. Hogg.	May Queen.
Exonian.	Sutton's A1.
Gradus.	

Very Dwarf.

Chelsea.	Sutton's Favourite
English Wonder.	William Hurst.
Notts' Excelsior.	

Second Early and Early Main Crop.

Duke of Albany.	Prince of Wales.
Duke of York.	Triumph.
Empress of India.	

Main Crop and Late.

Autocrat.	Ne Plus Ultra.
Captain Cuttle.	Sharpe's Queen.
Daisy.	Stratagem.
Magnum Bonum.	Veitch's Perfection.

ROUND PEAS FOR MARKET.

First Early.

Ameer (Laxton).	Sangster's Improved.
Eclipse or Alaska.	William I.

Second Early.

Lye's Favourite	Telegraph.
-----------------	------------

Main Crop.

Gladiator.	Pride of the Market.
------------	----------------------

Potato (*Solanum tuberosum*).—A perennial with tuber-like stems, popularly known as tubers, native of Peru, Colombia, Chili, and possibly Mexico. It is said to have been first introduced into Europe about 1580 by the Spaniards, although the popular belief is that it was first brought by Sir Walter Raleigh in 1586 from Virginia.¹ Gerarde, the English botanist, certainly grew the Potato in his garden at Holborn in 1596. It was, however, only as a curiosity or delicacy that the Potato was then cultivated, for some reason a prejudice against its use as food prevailing for many years. In the eighteenth century it became better known and more cultivated in England; and in 1796 no less than 1700 acres in Essex were planted with Potatoes for the London market.

The following particulars of the cultivation and improvement of the Potato in Europe are from a paper published in the *Journal of the Royal Horticultural Society*, vol. xix (1896) by Mr. A. W. Sutton, F.L.S., the senior member of Messrs. Sutton & Sons, Reading.

It may be interesting to note that the area of Potatoes planted in the United Kingdom in 1894 amounted to 1,232,055 acres, averaging 3 tons, 15 cwt., 2 quarters, 20 lbs. per acre, or a total of 4,662,147 tons grown in the United Kingdom,² besides a large quantity imported (for 1893 the figures were 14,140 tons). Reckoning the entire population as 37,880,764, this would allow about 2½ cwt. for every man, woman, and child per annum; but these figures make no allowance for the quantity annually consumed in feeding cattle, which is always considerable, and varies in proportion to the market value of Potatoes; nor do they take into account the tubers planted as seed.

Monsieur H. de Vilmorin has very kindly sent me the figures for France, and he tells me

¹ See B. D. Jackson on "The Introduction of the Potato into England".—*Gardener's Chronicle*, 1900, xxvii, 161, 178.

² In 1900 the figures were:—

Great Britain,	2,735,000
Ireland,	1,841,000
Total,	4,570,000.

These figures are nearly 1,000,000 less than the total for 1899.

that the area under cultivation is annually about 3,342,500 acres, and the total yield for the

this immense quantity, Herr Benary says that 1,313,584 tons were employed for distilling; but he is unable to state what proportion of the remaining 24,988,180 tons was used in the manufacture of starch, as no statistics are obtainable.

From the figures quoted we get some idea of the enormous commercial and economical advantages which have accrued from the introduction of the Potato into Europe.

Improvement and Deterioration. — It would now be interesting to trace the steps by which the great improvement in the cultivated forms of the Potato has been brought about. Fortunately, in this instance the old rule that "like produces like" does not hold good; for had the development of the Potato been restricted by such limitations, it is probable that our present supply would be similar in character to those of which Gerarde speaks. And here it is necessary to refer to a misunderstanding arising from the fact that "seed Potatoes" and "Potato seeds" are sometimes re-

whole of France is 10,100,000 tons, or, making allowance for the quantity exported and imported, the consumption amounted to 10,000,000 tons. Whilst in England Potatoes are grown almost entirely for use as an esculent, Monsieur Vilmorin estimates that about two-fifths, or 4,000,000 tons, are annually used in France in the manufacture of starch and alcohol.

I also learn from my friend Herr Fritz Benary of Erfurt, who has placed in my hands very valuable statistics, that the area devoted to Potatoes in the German Empire in 1893 was 7,592,165 acres. The total quantity of Potatoes harvested amounted to 32,277,851 tons, or, allowing for the quantities imported and exported, 32,376,497 tons, which was the total quantity available for use. Out of this total 6,074,732 tons were reserved to plant the crops of the following year, leaving 26,301,765 tons for consumption as food and for manufacturing purposes. Of

garded as synonymous terms. "Seed Potatoes" are grown from perfectly true and reliable



Fig. 1252.—Potato Flower.

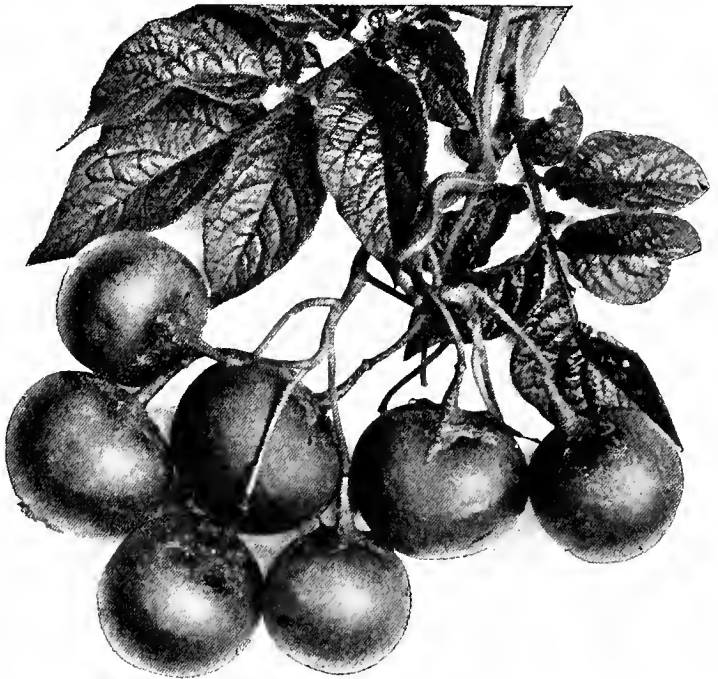


Fig. 1253.—Potato Fruits and Foliage.

stocks, the crops being carefully examined year after year with the special object of ensuring

the perpetuation, unmixed, of any given variety. Frequently the tubers of an ordinary crop, which are too small for market, are kept back for planting, and dignified with the title "Seed Potatoes".

I need scarcely remind you that Potatoes are mere enlargements of underground stems, shortened and thickened, in which starch is stored up in smaller or larger proportion according to the characteristics of the several varieties. Like other underground stems, the tubers possess buds or eyes, from which, by fresh shoots, the plant is capable of re-development; and although the tubers may be preserved through the winter for planting again in the following spring, they are neither more nor less than portions of the plant which died down and apparently ceased to exist in the previous autumn. Hence the life of a single Potato plant may be prolonged year after year until through weakness or deterioration it comes to an end. It will therefore be obvious that improvement by selection of the tubers is impracticable. Anyone can demonstrate this by planting a tuber which from any cause may be misshapen. The produce will revert to the uniform type of the variety to which it belongs. The only modification of this rule I am acquainted with is in the cases where *all* the tubers of one plant show a uniform divergence in character, either for better or worse. When this is so it is possible that, by the selection of all or any of these tubers, a slightly different Potato might result, as in the case of some types of the Ashleaf section, which are dwarfer and more compact, or else taller and coarser-growing, than others. Outside the Ashleaf class, however, I know of no such instances. A really first-class seedling Potato is not liable to degenerate so quickly as is generally supposed. If degeneration sets in soon after its introduction, it merely proves that the variety is one which ought never to have been brought to public notice.

Raising Seedlings.—Potato seeds, on the other hand, are formed in the Potato berries which some, though not all, varieties of Potatoes bear freely (fig. 1253). A berry may contain from 100 to 300 seeds, the average of five berries examined being 232, and as the parent plant appears able to control but slightly the distinctive character of its progeny, and as all the different seeds from one berry may produce plants differing from one another, not only in form, but many of them in colour also, it is here we find the great possibilities for improv-

ing the race by selection of the better seedlings. Even if no cross-fertilization of flowers was attempted, great improvement might be made by the selection of the most promising

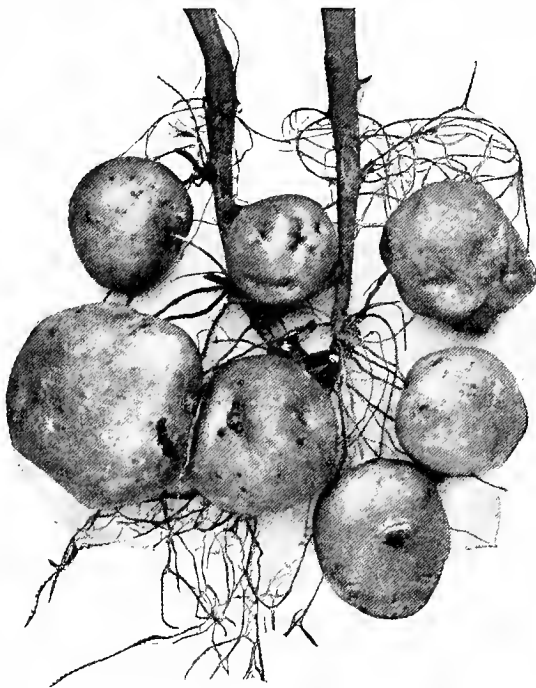


Fig. 1254.—Potato Seedling.

seedlings during the first few years of their existence; but where judicious crossing of the best-known varieties is undertaken we can in a great measure combine in some of the resulting seedlings the merits of both male and female parents, although even then no two seedlings from the same berry may be exactly alike.

Those who attempt to raise seedling Potatoes must possess patience. Like many other species which are not habitually multiplied by seed, the Potato has a remarkable tendency to revert to the wild form. It may be necessary to cultivate 100, or even 1000 seedlings, before finding one which is really worthy of a place amongst the better varieties already existing. M. Vilmorin says that in France the raising of seed Potatoes has been proceeded with in a somewhat hap-hazard manner; whereas in England, on the other hand, a more systematic method has been followed, richness in starch, excellence of flavour, power of resisting disease, with little tendency to develop haulm, being the characters we on this side the Channel generally seek. Unfortunately, he says, they are not always able to profit in France by progress realized in England, because the French have a marked

preference for Potatoes with yellow flesh, whereas in England, for many years past, there has been a preference for white-fleshed Potatoes. On this account even the celebrated *Magnum Bonum* (fig. 1255), which my house had the honour of introducing in 1876, after having

place in Ayrshire; and to Mr. Charles Ross, Mr. A. Dean, and others, whose attention has been chiefly devoted to the raising of garden Potatoes.

Credit is also due to Mr. A. Findlay of Markinch, for introducing one of the heaviest cropping

Potatoes of the day, viz. *Up-to-Date*, as well as *British Queen*, *Jeanie Deans*, and *Challenge*; and to Mr. C. Fidler of Reading, who has introduced *Reading Giant*, *Colossal*, and *Queen*.

Amongst other Potatoes which have taken a prominent place in recent years, as a result of hybridization [crossing], the following deserve mention:—

Beauty of Hebron (from America).

Early Puritan (from America).

Early Rose (from America; largely grown in S. Africa).

Schoolmaster (introduced by Turner of Slough).

Snowdrop (introduced by Perkins of Northampton).

The Saxon (from Germany).

Victor (introduced by Sharp of Sleaford).

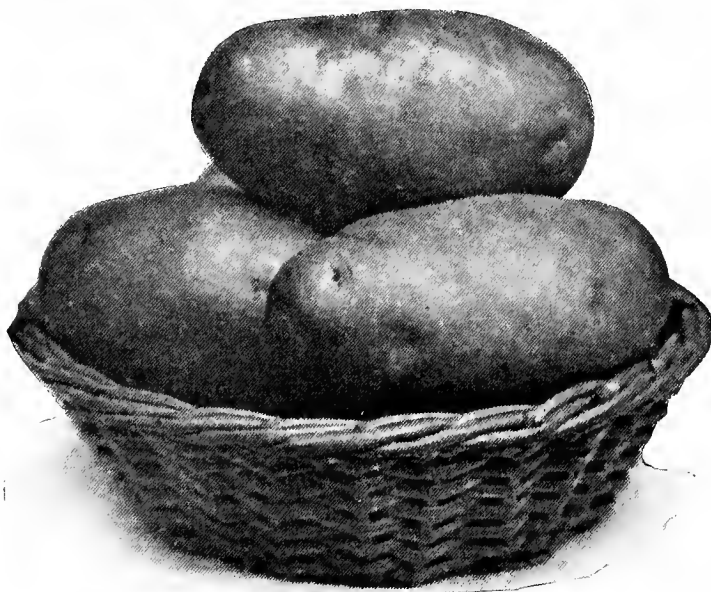


Fig. 1255.—Potato—*Magnum Bonum*.

enjoyed a brief popularity in the Paris markets, has been almost abandoned as a table variety on account of the flesh being too pale in colour. M. Vilmorin remarks that in Germany considerable attention has been given to the raising of seedling Potatoes, and more particularly with the object of obtaining varieties which are specially adapted for the production of alcohol and starch.

Modern Introductions.—English Potato-growers are indebted to the lifelong labours of such men as the late James Clark of Christchurch, Hants, who raised the following amongst other standard varieties (most of which I have myself been responsible for introducing):—

Abundance,	Nonsuch,
Ideal,	Reliance,
Invincible,	Satisfaction,
<i>Magnum Bonum</i> ,	Supreme,
<i>Maincrop Kidney</i> ,	<i>Sutton's Seedling</i> ,
<i>Ninety-fold</i> ,	<i>Windsor Castle</i> ;

to the veteran Mr. Robert Fenn of Southampton, Berks, whose best-known seedlings are *Ring-leader*, *Early Regent*, and *Reading Russet*; to Mr. Shakeshaft of Lymn, Cheshire, who raised *Harbinger*, which has taken so prominent a

CULTIVATION

Soil.—The best soil for the Potato is a naturally good friable loam, rather light than otherwise, and free from stagnant water. In such soil the produce is abundant and the quality good. Thin sandy soils also produce well-flavoured Potatoes; but of course to obtain quantity of produce the assistance of manure is necessary. The worst soils for the Potato are those which are naturally wet and heavy, and those which have long been cropped and heavily manured; hence, garden ground in most cases does not produce tubers of so good quality as those obtained from the fields. It is therefore not advisable to occupy the garden with any but early kinds, if the general supply can be obtained from the fields. The soil ought to be prepared well in advance by digging it deeply and turning it up roughly so that the action of frost, &c., in winter may pulverize and otherwise improve it.

Manure.—In good garden soil the less manure that is used the better flavoured will be the produce, and it will also be much less affected by disease.

Farmyard manure spread along the bottom of the furrows, and the sets placed upon the manure, is a very common practice. Many prefer planting the sets, and then laying the dung over them. When dung is scarce and the soil poor, these modes of application may be advantageously pursued, but in gardens the manure may be dug in equally. Long dung is good for moist, loamy soils, and fresh littery stable dung is suitable for early crops. Farmyard manure mixed with wood-ashes answer well, the ashes lessening the tendency to disease. Cow-dung is a more lasting manure than horse-dung, and is considered better for late sorts in warm, dry, sandy soils, as it retains more moisture. It should be well mixed with litter, and be placed below the sets, so as not to be in contact with the young tubers, otherwise it is apt to make them scab. The same remark applies to pigs'-dung, which should be either well mixed with the soil, or preferably formed into a compost with earth previous to planting.

Where the soil is damp and heavy a dressing of dead leaves is of advantage in keeping the ground open. They may be placed under or over the sets, or both, or distributed equally throughout the soil in digging; but they should be turned over and thoroughly wetted before they are dug in; for if turned into the soil in cakes, they are apt to remain in that state and become musty. Wood-ashes are useful for supplying potash and other inorganic substances required by the plant; and they may be advantageously applied where the soil contains a large amount of decayed vegetable matter. The same remark will apply to lime, which is also useful in killing slugs and other vermin which attack the tubers. Gypsum, bone-dust, and superphosphate of lime are best for humid soils; they induce earliness, and where this is an object they may be applied with considerable advantage.

In the *Journal of the Board of Agriculture* for March, 1901, there is a notice of some experiments made in the manuring of Potatoes, by Mr. R. P. Wright. The experiments were conducted in Cheshire, Yorkshire, Northumberland, Durham, and the centre and south-west of Scotland. The chief object aimed at was to discover the cheapest and most effective method of manuring for Potatoes, but incidentally some valuable information was obtained on some other points of practical importance. One of these was that some varieties responded to the application of manures to a much greater degree than others.

In ordinary practice Potatoes are rarely grown except with applications of farmyard manure, to which artificial manures may or may not have been added. In the experiments there were plots to which farmyard manure alone was applied in the usual quantity; other plots to which, in addition to farmyard manure, artificial manures were applied as dressings; other plots were treated with artificial manures without farmyard manure.

In no single instance in all the trials recorded was there a case found in which farmyard manure failed to produce a considerable increase of crop. The amount of increase varied, the conditions under which the experiments were made being so diverse in regard to manures, soils, and climatic conditions.

Farmyard manure applied at the rate of 15 tons per acre gave the maximum yield. On the other hand, farmyard manure at the rate of 10 tons per acre proved insufficient of itself to produce a full crop, and the addition of artificial manures gave a very profitable increase.

Experiments in Yorkshire on the effects of liberal application of farmyard manure, as compared with an equally liberal and suitable combination of farmyard and artificial manures, gave results slightly in favour of the former, viz.:—

20 tons farmyard manure per acre, produced 10 tons 10 cwt.	
10 tons farmyard manure, 1½ cwt. sulphate of ammonia, 6 cwt. superphosphate, 2 cwt. sulphate of potash,	} per acre, produced 10 tons 6 cwt.

For Potatoes it is not as a rule advisable to use artificial manures only, but under some conditions farmyard manure in moderate quantity, supplemented with suitable artificial manures, will give better results than farmyard manure alone. It has been proved that unless the artificials be composed of a suitable combination of ingredients, and be given in the right quantity, they will not produce a satisfactory crop. The combination that has given the best results when used alone is:—

6 cwt. superphosphate, 2 „ sulphate of ammonia, 1 cwt. nitrate of soda, 2 cwt. sulphate of potash (91 per cent),	} per acre.
---	-------------

From the above it will be seen that the selection of manures must depend on the nature of the soil, the climate, and the variety cultivated. In soils where the haulm grows too luxuriantly, no manure, or at all events none that would materially increase that luxuriance,

should be applied, especially if the climate is moist. Superphosphate would probably be the best application under such circumstances. Varieties naturally dwarf will bear ammoniacal manures better than those that are naturally tall.

Propagation.—Potatoes are easily propagated by seeds, cuttings of the stem or branches, by planting whole tubers, or by those cut into sets. The seeds should be sown early in spring, in pans filled with rich light soil, placed in moderate heat. Before the young plants get crowded, they should be pricked out into small pots, and shifted as they require it; or they may be planted in rich soil under a frame with very slight heat, giving them plenty of air in fine weather, and more or less at all times when there is no danger of frost. The plants should be fully exposed before planting out, which had better be deferred till fine weather in May. They ought to be planted in a rich warm border, putting a little leaf-mould below them, if it can be afforded,

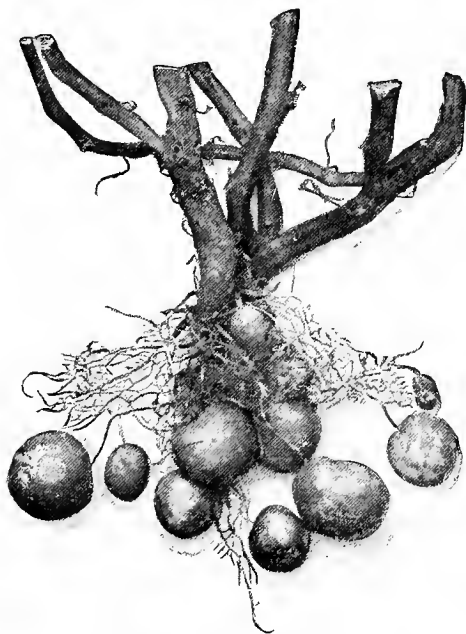


Fig. 1256.—Potato Seedling, 1st year.

to assist their rooting. Afterwards they should be earthed up according to their strength. Only small tubers will be produced the first year (fig. 1256); but these, planted in the following spring, will produce full-sized tubers. If neither glass nor artificial heat is at command, the seeds may be sown on a warm border.

Propagation by cuttings may be successfully resorted to for increasing any particular variety. For example, the original tuber may be cut into

sets, planted early in spring, in heat, and the rooted shoots cut off near the base when they have reached a finger's length, and planted in rich soil. Fresh shoots will push again and again from the original sets, and may be treated in the same way. Propagation by planting the tuber, or parts of it furnished with eyes, is, however, the mode usually employed.

With many it is a doubtful question whether whole or cut tubers yield the greater return. From experiments made in the garden of the Horticultural Society at Chiswick it was found, on the mean of two plantations, one made in March and the other in April, that the produce from cut sets exceeded that from whole tubers by nearly 1 ton per acre. In the April planting the produce from the whole tubers was somewhat greater than that from single eyes; but in the March plantations the cut sets gave nearly 2 tons per acre more produce than the whole tubers, the weight of Potatoes planted being deducted in every case. In opposition to this must be placed various American experiments, as well as those at Warminster, in all of which the best results were from uncut sets.

Another important consideration is, whether small or large tubers should be employed as sets; for, if by using the former an equally good crop could be obtained, a considerable saving in the expense of sets would be effected. Large tubers, however, are preferable for the following reason:—In all plants large buds tend to produce large shoots, and small or weak buds the reverse. Now, the eyes of Potatoes are true buds, and in small tubers they are comparatively weak; they consequently produce weak shoots, and the crop from such is inferior to that obtained from plants originating from larger tubers, furnished with stronger eyes; and this conclusion has been arrived at as the result of actual experiments.

The part of the Potato employed for sets is not a matter of indifference. It has been found by experiment that sets taken from the points of the tubers, and planted in March, yielded at the rate of upwards of 3 tons per acre more produce than was obtained from employing the base of the tubers. In a plantation made in April the difference was much less, but still in favour of sets from the points or top ends of the Potatoes. Cottagers may therefore use with advantage, say two-thirds of the base of the tuber, and put aside the top for sets.

In each and every case tubers for planting ought to be kept from exhausting themselves by premature sprouting. The loss of the prim-

any sprout practically spoils Ashleaf as well as those with Lapstone blood in them, and greatly weakens the others. The former should therefore be stored in single layers, largest or sprout end upwards, in shallow trays or baskets (fig. 1257), which may be stored one above another, always providing a certain amount of light and

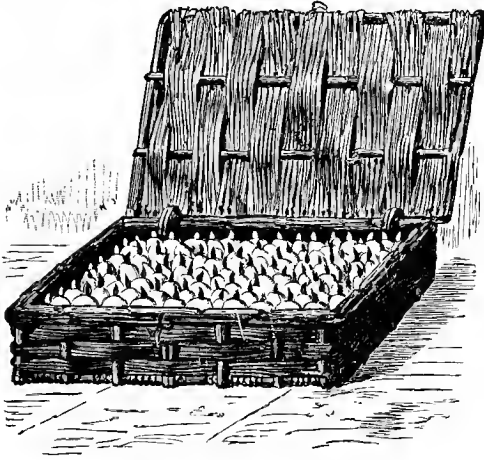


Fig. 1257.—Sprouted Seed-Potatoes.

air reaches them. They even keep better left heavily moulded up where they were grown than they do in hampers, deep boxes, cellars, and warm rooms. All other varieties ought also to be stored thinly, and given all the light and air possible short of allowing them to be badly injured by frosts.

Potato Sets.—The eyes at the base of a Potato are few compared with those at the top, and they are also sometimes blind, or so weak that they do not push. Such sorts as Snowdrop, which have the eyes almost level with the general surface, are most apt to be blind. As the base of the eye slants downwards towards the centre of the tuber, the knife should be inserted above the eye, and the cut should slant downwards towards the centre, and parallel to the direction of the base of the eye. In times of scarcity, recourse has been had to merely scooping out the eyes for sets, or stamping them out with a hollow punch, the bulk of the Potato in either case being left for food. By early planting in well-prepared soil, good plants can be reared by this mode, especially if the season prove favourable.

When only small portions of the tuber accompany the bud, the planting should be performed as early in spring as the state of the weather will permit. If the weather or state of the ground be unfavourable, the small pieces for sets may be placed with the buds

upwards in soil under cover till they can be planted out in the open ground. Others cut the sets and dry them before planting, but this does not appear to be of any advantage; on the contrary, many of the dried sets do not push at all, and others but weakly.

A change of sets is advantageous. Instead of using tubers produced for many years successively in the same soil and in the same locality, it is found advantageous to obtain sets grown in a different soil, or in a different part of the country, or both. That it is profitable to procure sets from a higher part of the country is highly probable. The superiority of sets grown in elevated situations is probably to be attributed to the plants being well exposed to light. Tubers grown in shaded situations are of bad quality as compared with those produced in the open fields, all other circumstances being the same. We therefore conclude, that sets are best from tubers grown in elevated situations, not because they may happen to be more watery than those grown in low ground, but from the plants having had the advantage of a greater share of light, in consequence of which their organization is more perfect; and as it is admitted that a change of sets is beneficial, that change should be from high open situations to such as are lower.

Planting.—The usual time of planting is spring, and the earlier the better, provided the ground is in proper working order. If this be the case in the end of February, so much the better; but at all events the planting should be done by the 1st of March, or as early in that month as circumstances will permit. The late Thomas Andrew Knight paid much attention to the cultivation of the Potato, and with great success. With regard to the period of planting, he says, I have uniformly found that to obtain crops of Potatoes of great weight and excellence, the period of planting should never be later than the beginning of March.

Autumn planting has been recommended as a preventive of the disease; but, if the Potatoes are kept in contact with soil of nearly the same temperature as the ground, they will be in much the same circumstances as if they were planted, only more secure from the injurious effects of frost and saturation. Besides, the ground when planted and dug before winter, and afterwards drenched and beaten by the winter rains, cannot be in such good condition for the progress of the roots as that which is newly prepared at the time of planting in spring.

The distance apart at which the sets should be placed depends on the soil, the situation as regards exposure to light, and the sort planted. According to these circumstances, the rows ought to be from 15 to 30 inches apart. Generally, the distance of the rows from each other should be equal to the height of the stems. Hence, those which grow only 1 foot high would be 1 foot apart, and those which attain the height of 3 feet would be that distance apart. As regards exposure to light, this is a good rule; but rows only 1 foot apart do not admit of being properly earthed up, and this consideration must not be overlooked. If soil be taken from between the rows to form the ridge in earthing up, it can scarcely be done properly if the rows are only 1 foot apart. Sufficient earth could be introduced between the rows from alleys or adjoining spaces left for the purpose, but it is better to make the rows not less than 15 inches apart, even for dwarf early sorts. Those which are somewhat stronger growing, and later, may be allowed 18 inches between the rows, or 21 inches if the soil is rich and the situation not fully exposed to light. In light soil 2 feet for second early crops may be considered sufficient. For the general crop, 2 to 3 feet between the rows have been found good distances, as they admit of the plant being earthed up on a good principle. The stronger growers being found the best disease resisters are rightly more extensively planted in rich garden soils than formerly; they are also preferred for field culture.

The distance between the sets in the rows also should be regulated by the nature of the soil and the variety. In rich soil, of course, more space should be allowed than in poor; and considerably more for vigorous-growing sorts than for those with small dwarf stems.

The distance may vary from 6 to 12 inches. The less distance will be proper for the dwarf sorts, the greater for the strong-growing ones. In general, 8 inches from centre to centre of the sets will be found a very good distance for garden crops. In the case of very strong-growing kinds it cannot be denied that quite as much produce may be obtained at 12 or 15 inches apart in the rows as at 8 inches; but when the plants have much space, they are apt to produce tubers varying greatly in size, some of the first formation being too large, while those of a later production are too small. In neither case are the tubers so good as when there is a more equal crop; and it should therefore be the aim to obtain a crop of this description.

If a sort is naturally inclined to grow too large, it is well to plant it rather closely in the row; and it is better to do this than to limit the distance between the rows. It is much better to have the rows 27 inches apart and the sets 8 inches asunder, than to have the rows 24 inches apart and the sets 9 inches from each other; and this, again, is preferable to rows 18 inches asunder and sets 12 inches from each other. In either of these ways the same number of sets will be required to plant a rod of ground; but there is, in the greater distance between the rows and the less distance between the sets, a double advantage: first, as regards the labour in planting, and, secondly, in a greater space for earthing up being afforded. When planted at the distance of 27 inches from row to row, the number of trenches required to be cut out is one-third less than when the rows are 18 inches apart; and when planting by the dibber is adopted, one-third more ground has to be traversed. The advantages in earthing up will be noticed when that operation comes to be considered.

A proper depth for the sets is 6 inches. This is shown by the following particulars of an experiment on the effects of different depths of planting:—A piece of ground was divided into four equal parts, and planted with Potato sets in the second week in April, at the respective depths of 3, 4, 6, and 9 inches. The results computed for an acre are as follows:—

Depth. Ins.	Produce.		
	tons.	cwts.	lbs.
3.....	13	0	14
4.....	14	1	18
6.....	14	11	4
9.....	13	0	11

The greatest produce was from the plantation 6 inches deep; and next to it, from that at 4 inches. Those planted only 3 inches deep gave the least return. Many of the sets buried 9 inches did not vegetate, or at least failed to reach the surface.

Shallow planting is recommended for cold low-lying positions and heavy soils. In the latter case, laying the sets quite on the surface and heavily moulding over has been proved preferable to the practice of planting in drills.

As a precaution against frost, autumn-planted Potatoes should be planted fully 7 inches deep; or the rows should be covered with leaves, fern, litter, or other protecting material.

Potatoes are planted in various ways; but the modes usually adopted in gardens are in trenches cut out by the spade or digging-fork,

or in holes made by a blunt dibber. The soil cannot be too loose, and trench-planting has, in this respect, a great advantage over planting with the dibber. In planting in trenches, if the ground requires no manure, let an opening be taken out along one side of the quarter in the direction of north and south, or nearly so; next, dig a breadth equal to rather more than half the distance between the rows, then stretch the line at the half-distance from the edge of the quarter, and cut down by the line to the depth of 6 inches, or to whatever other depth the sets are to be put. Then place the sets, with the eyes or buds upwards, in a line along the bottom, at the proper distance asunder, and cover them with some well-broken soil. After this dig another breadth, levelling the surface at the same time, and stretching the line at the distance which is to be allowed between the rows; cut out another trench, plant the sets as before; and so proceed till the whole is completed.

If dung is to be used, the trenches must be cut a little deeper. A wide opening should be maintained by drawing the soil well forward, so that the bottom of the trench may be wide and the layer of manure may be spread equally. It is advisable to throw some soil over the manure previous to placing the sets, which are liable to be injured if placed in contact with it.

Dibber-planting is extensively practised, and is perhaps the most expeditious, except where the plough can be employed. The mode of proceeding is very simple. A blunt dibber, having a cross tread rather farther from the end than the depth at which the sets are intended to be planted, is used by one person to make holes, whilst another drops in the sets, so that the eyes of the latter may be uppermost. The holes are afterwards filled up with earth drawn by the hoe.

In dibber-planting, moist soils are rendered too compact by the treading in performing the operation; and, if the soil be dry and light, the earth falls more or less into the holes, and the sets are consequently at unequal depths. For

these reasons we consider that planting by the spade or fork—the latter answering best on badly working soils—is preferable to that by the dibber for garden crops; and it will be found that the advantages with which the former method is attended will more than compensate for the saving of time effected by adopting the latter.

In some parts of the country, and particularly in Lancashire, the ground for early crops is thrown up in ridges before winter; in spring a portion of the pulverized soil from the surface of the ridges is collected in the bottom of the furrows; a little manure is placed over this, and the sets are planted upon it and covered with 2 inches of soil. When the young plants appear another 2 inches of soil is added, and 2 inches more when they push through again.

Subsequent Culture.—This consists in stirring the surface of the ground, keeping it clear of weeds, and earthing up the plants. The more the ground is pulverized the better. It is a good plan to hoe it over, when not too moist, before the shoots reach the surface; and again before earthing up, if it is not naturally friable. As regards the growth of the plant and bulk of produce, this operation is altogether unnecessary in deep, light soils; for the roots are, in general, found below the level of the original surface of the ground, so that they do not derive any benefit from the operation; and in dry seasons and in dry soils the crops from plants earthed up have been lighter than where they have not been earthed up, probably owing to the earth being drawn to a sharp ridge, by which the rain is thrown off beyond the roots.

Earthing up is advantageous, and even necessary, for Potatoes which have a tendency to throw their tubers above the surface. About ten days or a fortnight after the plants have appeared above-ground, a little earth should be drawn towards the stems, but not so as to cover the foliage, or interfere with its free exposure to light. If the soil is not very moist, and the season dry, this earthing up should be highest at the outsides, so that in consequence of the slope towards the plants the rain may penetrate to the roots; and the earth should not be drawn so as to leave the interval deepest in the middle, otherwise the rain-water would run there, instead of to the roots. On the other hand, where there is too much moisture, the earth should be made to slope from the plants. As these advance in growth the intervals between the rows should be stirred and made fine, to render the soil suitable for the second and final earthing

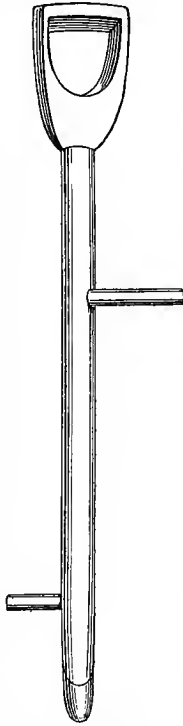


Fig. 1258.—Potato Planter.

up. The principal use of this is to form a covering for the tubers, so that with their increase in size they may not be exposed to light, which would soon render them unfit for human food, though good for sets. The soil should therefore be drawn, not so as to form a triangular ridge, with straight sloping sides, through which the tubers would be apt to protrude, but, on the contrary, broad-shouldered ridges, as wide at top as they can well be made. Their height will partly depend on the distance between the rows and partly on the depth of the roots. If the former is limited, no great amount of earth can be obtained; and such is also the case if the roots are near the surface.

Early Crops.—If Potatoes are wanted early, the tubers should be placed in a warm place, in January, till they push. They may then be planted where they can be protected with litter, fern, or other covering. Dwarf early sorts may be forwarded in pots in any warm place, and when above-ground they should be exposed to light and sun when there is no danger of frost. In March they may be planted out in front of a wall or paling, where they can be protected in case of severe weather. They may also be planted in some warm spot, in beds with dry turf sides, about 1 foot or 15 inches high, over which thatched hurdles can be placed at night, or as the state of the weather may render necessary.

Winter Crops.—Select a middling early sort, such as Rivers' Royal or Myatt's Ashleaf, and let the tubers be kept in a cool, dry place, on a hard bottom, and frequently turned, so as to check the vegetation as much as possible till the end of July. If then planted, tubers will be formed before winter, which should be taken up and packed in dry soil, closely beaten. Kept in this way they will form in winter a pretty good substitute for forced Potatoes.

The following is another method:—Tubers of the preceding year's growth are kept in a cool place till autumn; care is taken to prevent vegetation as much as possible, and all sprouts are taken off as they appear. About three months before a supply is required, the old tubers are piled up in alternate layers with light garden soil, laid to the thickness of 5 or 6 inches, in a cellar or in boxes placed in any spot where there is a temperature of 50° or 60°. By this process, although no leaves are produced, small tubers are formed out of the substance of the larger ones; but, as might be expected, the produce is vastly inferior in quality to forced Potatoes.

Lifting and Storing.—Early crops, of course, are taken up as soon as they are fit for use. Before the disease attacked the Potato, the main crop for storing was allowed to remain till the stems and foliage withered from natural decay. After this had taken place, and before there was any danger from frost, was considered the best period for lifting. Such it still would be if there were no disease to arrest prematurely the vegetation of the plants, and render it necessary to remove earlier than usual the threatened crop of tubers. Waiting for the haulm to ripen or wither may mean the loss of a considerable portion of the crop from disease, whereas if lifting takes place directly the tubers are fully grown, and therefore before the haulm has commenced to wither, the whole may be saved. This comparatively early lifting does not seriously affect the quality of the tubers nor their keeping properties. Dry weather is, of course, most favourable for the operation; but as for the necessity of drying Potatoes that are to be pitted in the soil, there is none; for we have seen Potatoes as wet as possible when pitted, that nevertheless came out dry enough. It is true the pits were not large, nor should they ever be; and their bases were higher than the level of any water which could collect around them, such being carried away by a track made for the purpose.

Non-exposure to Light.—If the weather is cloudy so much the better, for the tubers should be exposed to light as little as possible, and more especially not to bright sunshine. It is well known that all the green parts of the Potato are more or less poisonous, and so the finest white floury Potatoes become, by exposure to light. Potatoes may be white, black, or purple, externally, and their flesh, notwithstanding, be white and good when cooked; but expose them to the light for a longer or shorter period, according to its intensity, and the flesh of all will become green and unwholesome. Some persons dig up their Potatoes and leave them exposed to the sun's rays to dry previous to storing; but this is a bad practice, for three days of bright autumn sun will green newly-taken-up Potatoes to a very injurious extent; and this being the case, the tubers should not be exposed to the sunshine even for a single day.

It should therefore always be borne in mind that from the time Potatoes are taken out of the ground till they are to be cooked, they should be exposed to light as little as possible. If, after having been dug up, they must lie on the ground in heaps for but one day, or even

less, they should be protected from light till they are pitted. If stored in a shed, loft, cellar, or any other place, light should be entirely excluded; if in a building, to the interior of which light must be admitted, it should nevertheless be prevented from reaching the tubers by some close covering. Tubers intended to be used as sets are supposed to be improved by partial greening.

Protection from Frost.—In choosing materials to protect the tubers from frost, and at the same time preserve them from being injured through heat or rot, care should be taken to avoid using anything that is likely to taint their flavour. Potatoes keep best in small quantities; for, when in large heaps, they sometimes ferment. The form of a ridge is more convenient than that of a cone, because when portions are taken out for use the breach in the end of the ridge can be more easily closed than one in the side of a conical heap. The ridges should run north and south, so that if it be necessary to open them in frosty weather, that may be done at the south end, when the sun's rays at noon will prevent that part from being frozen. The ridge may be about 3 feet, or not more than 4 feet wide at the base, and as high as the Potatoes can be conveniently piled up. It should not be formed on wet heavy ground; that which is poor, dry, and on a slope is to be preferred. In throwing up the soil for covering, a trench will be formed round the base of the ridge, and this trench should be made deepest at one end, from which a track should be cut, so that water may not collect in the trench, which ought in all cases to be lower than the base of the ridge. In dry soil the latter may be sunk a few inches, but if otherwise the Potatoes should be laid quite on the surface of the ground.

As already observed, soil is best next the tubers, and the poorer it is the better. Straw admits of the Potatoes being taken out comparatively free from earth; but as it decays from contact with the soil, it injuriously affects their flavour. Dry turf may be laid next the Potatoes to prevent loose soil from mixing with them, or fresh turf laid with its green side outwards may be used for the same purpose; but as regards flavour these appliances are unnecessary, if not worse.

After covering with 8 or 9 inches of soil, it is a good plan to thatch the ridges with straw, fern, heath, or any other material calculated to keep out frost and wet. Potatoes intended to be kept till the following summer should be

placed in a shaded situation where the sun's rays cannot affect the ridges. If the soil of these should happen to be frozen in spring to the depth of a few inches, then by covering thickly with straw the Potatoes may be kept from pushing much longer than would otherwise be the case.

FORCED POTATOES.

Potatoes are forced in various ways—on hot-beds, in pits, and in pots placed in a vinery, Peach-house, or other structure where there is moderate heat with plenty of light.

Hot-beds.—The tubers which are to be used for sets are placed close together on a gentle hot-bed, or on the floor of a cellar, to vegetate, and when they have made shoots 3 or 4 inches long they may be planted on the hot-bed and covered with 8 inches of good light soil. They may be planted 6 inches apart, in drills 5 inches deep, and 1 foot from each other, and covered with 2 inches of light soil; afterwards, when the stems grow strong, the drills can be filled up level with the rest of the surface. Water should be given sparingly, but as the plants increase in size it may be more liberally supplied. Air must be freely admitted whenever the weather is favourable; but at night, and in frosty weather, the sashes will require to be covered with straw mats or other protecting materials. A mild and nearly uniform temperature should be maintained. The tubers may be used when they are about 1 inch in diameter, the largest being taken first, and the small ones being left to afford a supply in succession.

London market-gardeners obtain early Potatoes by the following method:—A long bed, 5 feet wide, is dug out to the depth of 2 feet. This is filled with hot dung, on which is placed a 6-inch layer of soil. Medium-sized whole Potatoes are used for planting; they are covered with 2 inches of soil, hooped, and covered over with mats and straw. In about a month they will have sprouted; frames are then got ready, placing 2 feet of hot manure along the whole line of framing, which is sometimes 100 yards in length; on this the soil is put to the depth of 8 inches; the Potatoes are carefully taken up from the striking-bed, all shoots are removed except the main one, and they are planted 4 inches deep. Radishes are then sown thinly over them. When the haulm of the Potato is 6 inches high, the points are nipped off; this is done in order to give the Radishes

fair play, and although it may stop the growth for a few days, still the crop of Potatoes is always excellent. Nothing more is required but to admit plenty of air, and give water.

Potatoes are also grown largely in hooped beds in the open ground. In the latter case the tubers are sprouted, as before. The beds or ridges are dug out 2 feet deep in January, filled with hot dung, and covered with soil to the depth of 10 inches. The Potatoes are taken up and planted 5 inches deep, and over them Radishes are sown. The ridges are then hooped

and successional crops planted in January and February.

Insect Pests.—Potatoes are assailed by a host of insects, but in a healthy state wireworms are the most injurious. See chapter on this subject.

Curl.—Potatoes are sometimes attacked by a disease which towards the close of the eighteenth century excited considerable alarm. In this disease the shoots become curled when young, and their growth is arrested; the leaves are curled and crumpled, and no tubers, or only

small and worthless ones, are produced. When the leaves first curl there is no sign of fungus, but at a later stage the stem and leaves become more or less studded with blackish, minute velvety patches. These are due to the production of innumerable large olive-brown conidia or spores of a fungus known as *Macrosporium Solani*. Spraying the Potatoes sufficiently early with dilute Bordeaux mixture prevents the disease from doing serious mischief.

Scab is a disease in which rough patches are formed upon the surface of the tubers. Though not very injurious it is very prevalent, most crops being more or less affected. It is often considered

as a sign that the Potato attacked is good and floury.

POTATO DISEASE.

This is the popular name for one of the most terrible of plant scourges (*Phytophthora infestans*, fig. 1259). It was first observed near Boston, U.S.A., also in Denmark and Norway, between 1840 and 1842, and by 1845 it had spread all over Europe, doing immense damage. Although the injury done at the present day is not so severe as during the first decade after its invasion, it is still with us, and during damp, warm seasons does a considerable amount of injury. In addition to the cultivated Potato, the disease also attacks several cultivated exotic species of *Solanum*, the common British *S. Dulcamara*, and the Tomato.

The earliest indications of the disease are the appearance of small brownish blotches on the leaves; these gradually increase in size, followed by a curling of the leaves, and in an exceptionally severe attack the leaves and stems become blackened and decayed within a few days, emitting a disagreeable smell.

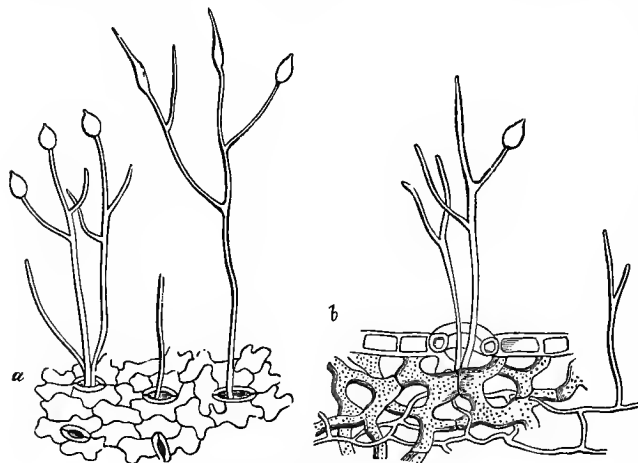


Fig. 1259.—*Phytophthora infestans*.

a, Young plants, with spores proceeding from stomata. b, Section of Potato-leaf, showing the mode in which the mycelium creeps amongst the loose tissue of the leaf.

over, allowing about 2 feet of space in the middle, between the mould and the hoop. They are covered with mats and straw; but as soon as the Radishes come up they are uncovered daily, and covered again every night. This is continued till the Potatoes are ready for digging in May, for sometimes large losses are occasioned by cold weather in April. Nothing more is done to the hooped beds beyond supplying them with water.

Pot Culture.—This is very simple; it is merely necessary to plant the sets in 8- or 11-inch pots, one set in the smaller and three in the larger size, filled to within 2 or 3 inches of the top with light rich soil. The pots may then be placed near the glass in a vinery, Peach-house, or pit, where a temperature of from 50° to 60° is maintained. With the exception of watering, and putting more earth in the pots as the plants advance in growth, no further attention is required. It is advantageous to sprout the sets previous to planting, as already recommended.

Forcing may be commenced in December,

If the brown spots on the under side of the leaf are examined with a pocket lens, numbers of delicate white threads will be seen, especially towards the circumference of the diseased patch. Higher magnification reveals that these delicate threads are simple or branched conidiophores, which originate from the mycelium of the fungus, ramifying the tissues of the leaf, and emerge singly, or most frequently in small clusters, through the stomata of the leaf, for the purpose of producing conidia on the surface of the leaf, whence they are readily dispersed by wind, rain, passing animals, &c. The conidia are egg-shaped and colourless, and are produced at the tips of the conidiophores; but when a conidium is once formed, the branch or axis bearing it continues to elongate in the same straight line, leaving the conidium apparently attached to its side. After the branch has grown for some time, a second conidium is produced at its tip, to be again left behind by the continued growth of the branch above it.

This peculiar mode of reproduction is the only constant feature that distinguishes the genus *Phytophthora* from *Peronospora*.

The conidia give origin to a number of zoospores when placed in a drop of water, or on a damp surface, as that of a leaf covered with dew. The zoospores move about actively for some time in the water, and finally settle down and emit a slender germ-tube, which enters the tissue of a leaf through a stoma, or bores directly through the epidermis.

Conidia that are washed by rain upon young tubers of the Potato that are exposed, produce zoospores, and these infect the young tuber, entering its tissues and forming a mycelium. The mycelium of the fungus also passes down diseased stems of the Potato, and thus infects the tubers, the mycelium either passing into a latent condition until the following season, when it renews its activity and grows along with the stems springing from the tuber; or it continues to grow after the Potatoes are stored, especially if "sweating" takes place, and in this manner frequently spreads rapidly through the mass of tubers huddled together.

Preventive means are—Spraying the growing haulms with Bordeaux mixture, which, apart from its action on the fungus, has greatly improved the yield of tubers. Potatoes obtained from a diseased crop should never be used as "sets", on account of the probability, almost certainty, of the presence of the mycelium in the tubers. Diseased stems, leaves, and tubers should not be allowed to lie and rot on the ground, neither should they be thrown into the piggery nor on the manure-heap; burning is the most effectual method. The disease is most severe where Potatoes are grown in a low damp district.

Although all known varieties of Potato are susceptible to the disease, some are much more so than others, and endeavours should be made



Fig. 1260.—Unsprayed and Sprayed Potato Plots.

to secure those varieties least susceptible to the disease in a given district. (G. MASSEE, in *Plant Diseases*.)

Mr. Sutton wrote: "I must not conclude without referring to the use of the *Bordeaux Mixture* as an application for preventing Potato disease. Fig. 1260 shows two plots of *Magnum Bonum* Potato growing side by side during the past season; that on the right-hand side having been sprayed three times, and that on the left-hand not having been sprayed at all. It will be seen that the effect was very marked. The growth of the sprayed plants continued some time after the unsprayed portion had died down. The weights of the two plots when lifted were as follows:—The sprayed, 3 cwts., 1 quarter, 25 lbs., and the unsprayed, 3 cwts., 1 quarter, 4 lbs. Strange to say, the quantity of diseased tubers was precisely the same in both plots, viz.

4 lbs. It is therefore a question whether the additional weight per acre would compensate the grower for the somewhat laborious task of spraying his crop three times during the growing period.

"In the elaborate series of experiments conducted this year in conjunction with Professor Gilchrist of the University Extension College, Reading, we found that in the first and second

lons of water. The two solutions are then allowed to cool before being thoroughly mixed together. If the mixture is too strong it will change the colour of a steel blade to that of copper, and more lime-water must be added until the colour of the steel is unaffected. The cost of this mixture is about a halfpenny per gallon. It is usual to spray the Potato plants three times during their growing season, the first in June. Of course it must be understood that the mixture is a preventive, and therefore it should be on the plants before the spores of the disease are there. There are various spraying-machines in the market for the application of Bordeaux Mixture. See also chapter on *Spraying Fruit-Trees* (ii. p. 40).

VARIETIES OF POTATOES.

Early Kidney.

Duke of York.—Haulm somewhat strong; no flowers; tubers large, of good form, white in colour, flesh slightly yellow. Cooks well, and the flavour is good.

Early Eclipse.—Haulm strong and branching; tubers large, smooth, white, flesh yellowish. Quality good.

Early Queen (Dickson).—Sturdy haulm; flowers coloured; tubers medium, skin white, flesh yellow. A very heavy-cropping, profitable variety.

May Queen (Sutton).—Haulm moderately strong; tubers large, of good form, floury-white and of good flavour when cooked. An extra early sort, excellent for forcing.

Myatt's Ashleaf.—Haulm moderately strong; flowers coloured; tubers white, flesh yellow. A heavy-cropping and very old favourite.

Ninety-fold (Sutton).—Haulm erect and dwarf; flowers white; tubers large, perfect in form, skin white, flesh very white and of good flavour. An extra heavy cropper. A valuable addition to early varieties.

Old Ashleaf.—Haulm short; tubers somewhat small, skin white, flesh yellow. Light-cropping, but desirable; extra early; one of the oldest and best sorts for forcing.

Ringleader (Sutton) (fig. 1261).—Haulm moderate in height and robust, foliage quite unlike that of the Ashleaf class. One of the earliest Kidney Potatoes, and has the advantage of being white in flesh. Immediately the tubers are large enough to lift, the flavour and quality are excellent.

Royal Ashleaf (Rivers).—Haulm moderately strong; flowers coloured; tubers long and thin, skin white, flesh yellow, of good flavour when cooked. A moderately heavy cropper.

Snowdrop.—Haulm strong and branching; tubers large, of good form, skin white, flesh white when cut. Cooks admirably.

Early Round.

A 1 (Sutton).—Haulm short and strong; tubers round, skin white, flesh when cooked firm, white, and dry. Heavy-cropping and good for forcing.

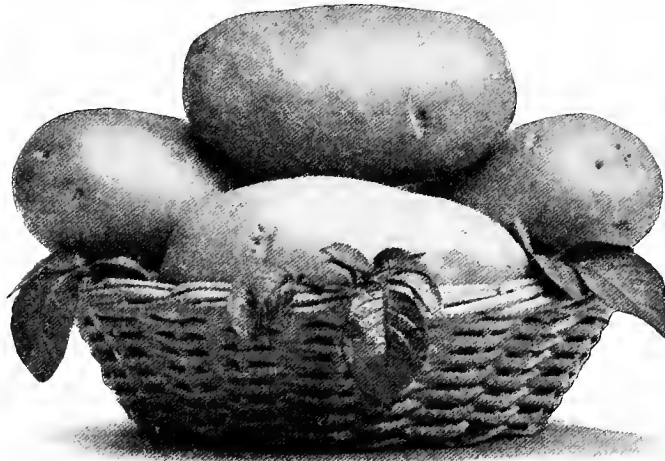


Fig. 1261.—Potato—Ringleader.

early varieties no advantage is gained by spraying. These crops finished their growth before disease could attack the plants, and the dressing did not appreciably lengthen the period of growth; in fact there was an actual loss on the sprayed plots. The experiments proved that sorts which are peculiarly liable to disease, especially when grown in gardens, if treated with a judicious application of the *Bordeaux Mixture* will yield a crop of sound Potatoes, even in years when ordinary crops are decimated by disease."

Bordeaux Mixture is a preparation of copper sulphate and lime, first used in Bordeaux about fifteen years ago to prevent the attacks of mildew on Grape-vines. It has since been used for numerous other fungus plant-diseases, with such satisfactory results that it has come to be looked upon as a safe, cheap, and effective fungicide for plants of all kinds.

The mixture is made up as follows:—

Water	50 gallons.
Copper sulphate	6 pounds.
Lime	4 pounds.

It is prepared by dissolving the copper sulphate in 25 gallons of water, and slacking the lime into a smooth paste before adding it to 25 gal-

Early Market Favourite.—Haulm tall and strong; flowers coloured; tubers large, skin white, flesh yellowish.

Early Puritan.—Haulm moderately strong; flowers white; tubers large, inclined to be oval, skin and flesh white, usually floury when cooked

Harbinger (Sutton) (fig. 1262).—Haulm dwarf and

Centenary (Sutton) (fig. 1263).—Haulm sturdy and strong; tubers moderately large, perfect in form, skin white, flesh white and floury. A heavy-cropping, disease-resisting variety; one of the best for field culture.

Challenge (Findlay).—Haulm extra strong; flowers coloured; tubers large, oval, skin white, flesh very white and floury when cooked. A heavy-cropping, disease-resisting variety.

Favourite (Cole).—Haulm moderately strong; flowers white; tubers large, oval, and of good form, skin white, flesh cooking very white. A good cropper.

Greentop.—Haulm strong and branching; tubers large, skin and flesh white. A heavy-cropping, disease-resisting sort.

Ideal (Sutton).—Haulm strong and branching; tubers large, oval, and pleasing in appearance. Of excellent quality when cooked. A heavy-cropping, disease-resisting variety, good alike for garden and field culture.

Jeannie Deans.—Haulm tall; flowers coloured; tubers large, oval, skin and flesh white. A good, reliable variety.

Supreme (Sutton).—Haulm moderately strong; tubers large, pebble shape, and perfect in

form, skin sometimes russeted, flesh white, cooking dry and floury. A heavy-cropping sort.

Second-early Round.

Cigarette (Kerr).—Haulm stout and branching; no

strong; no flowers; tubers medium, skin white, flesh very white and of good quality when cooked. Popular for pot and frame culture.

Hough Champion.—Haulm sturdy and strong; no flowers; tubers medium, skin white, flesh very white.

Kerr's Gem.—Haulm medium; flowers coloured; tubers large, skin white, flesh white, floury when cooked.

Royalty (Carter).—Haulm moderately strong; flowers white; tubers oval-shaped, white, flesh very white when cooked and of good flavour. One of the heaviest croppers in the section.

Ruby Queen.—Haulm low and strong; flowers coloured; tubers moderately large and of good form, skin purple, flesh white. A good cropper.

Victor (Sharpe).—Haulm short; flowers coloured; tubers oval in form, moderately large, skin white, flesh yellow and of good flavour when cooked. Suitable for forcing.

Second-early Kidney.

British Lion.—Haulm moderately strong; flowers coloured; tubers large and of good form, skin white, flesh cooking very white and floury. A very heavy cropper.

British Queen.—Haulm tall, strong, and branching; flowers white; tubers large, oval in form, skin white, flesh very white, of excellent quality when cooked. A heavy-cropping variety.

VOL II.

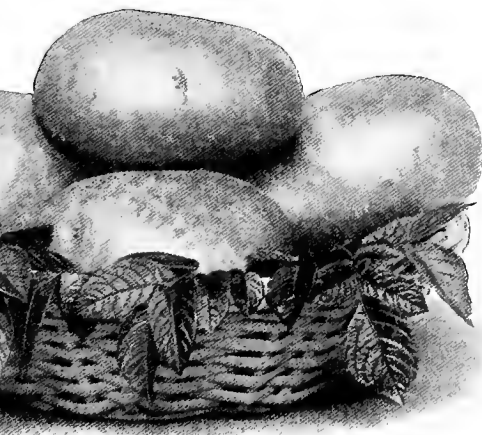


Fig. 1233.—Potato—Centenary.

flowers; tubers uniformly large, skin white, and flesh very white. One of the heaviest croppers in this section, but does not resist disease well.

Conquest (Findlay).—Haulm tall, strong, and branching; flowers white; tubers large, flattish-round, skin and flesh white. Very heavy-cropping, tubers rarely diseased.

Dumfries Model.—Haulm strong; flowers coloured;

tubers large, oval, skin white, flesh slightly yellow. An extra heavy-cropping, disease-resisting variety.

Epicure.—Haulm tall and strong; tubers large, flat-round, skin white, flesh very white, floury and good in flavour when cooked. A heavy cropper.



Fig. 1264.—Potato—Windsor Castle.

General Kitchen.—Haulm strong; tubers large oval to round in form, skin and flesh white. Good quality. A heavy cropper, succeeding well under field culture.

Monarch (Carter).—Haulm stout and branching; flowers white; tubers large, varying in form from round to oval, skin white and rough, flesh slightly yellow and of excellent quality when cooked. A good cropper.

No Plus Ultra (Sutton).—Haulm tall, strong, and bushy; no flowers; tubers flat, skin white, flesh very white, dry, and floury when cooked, and good in flavour. Heavy-cropping and disease-resisting.

Reading Russet.—Haulm strong and branching; flowers white; tubers moderately large and perfect in form, skin red and russety, flesh very white. A popular, fairly heavy-cropping variety.

Windsor Castle (Sutton) (fig. 1264).—Haulm tall and strong; flowers white; tubers large, perfect in form, skin and flesh white. In every respect a good variety.

Late Kidney.

Charles Fidler.—Haulm tall and strong; flowers white; tubers large and long, skin white, flesh white and floury when cooked. A heavy cropper; succeeds well under field culture.

County Councillor.—Haulm tall and strong; flowers coloured; tubers large and oval in form, skin and flesh white, cooking well. A heavy cropper, and resists disease well.

Grand Monarch (Dickson).—Haulm tall, strong, and branching; flowers coloured; tubers fairly large, oval, with white skin, white and floury when cooked. One of the heaviest croppers, not much addicted to disease.

Hough Giant.—Haulm tall and strong; no flowers; tubers uniformly large, skin and flesh white, and the quality excellent. Good for field culture.

Masterpiece.—Haulm stout; few or no flowers; tubers large, oval, and perfect in form, skin and flesh white; requires care in cooking.

Pride of Britain (Webb) (fig. 1265).—Haulm strong and branching; few or no flowers; tubers large, skin and flesh white, moderately heavy-cropping and disease-resisting.

Reliance (Sutton).—Haulm tall and strong; flowers white; tubers large, good form and quality, skin and flesh white. A great cropper.

The Bruce.—Haulm strong and erect; flowers coloured; tubers moderately large, skin white, flesh yellowish-white. Not a heavy-cropper, but resists disease well.

The Colonel.—Haulm tall and strong; flowers white; tubers large and oval, skin and flesh white, dry and floury when cooked. Very heavy-cropping, but liable to disease.

Late Round.

Abundance (Sutton).—Haulm tall and strong; tubers moderately large, skin and flesh white, cooking admirably. Heavy-cropping and reliable.

Beehive (Kerr).—Haulm stout and long; flowers coloured; tubers large, skin and flesh white and floury when cooked. One of the heaviest croppers in this section and a good disease-resister.

General Roberts.—Haulm tall and strong; flowers coloured; tubers oval, skin and flesh white, cooking



Fig. 1265.—Potato—Pride of Britain.

admirably. A heavy cropper, usually free from disease.

Goldfinder (Webb).—Haulm tall and stout; flowers coloured; tubers oval in form, skin and flesh white and excellent in quality when cooked. A heavy-cropping variety.

Syon House (Veitch) (fig. 1266).—Haulm tall and strong; tubers oval in form, large, skin white and rough, and a good cooker. Moderately heavy-cropping and generally reliable.

The Dean.—Haulm dwarf; no flowers; tubers medium, of good form, skin purple, flesh white,

The Garton.—Haulm tall and strong; flowers coloured; tubers medium, skin and flesh white. A good, heavy-cropping, reliable field Potato.

Triumph (Sutton).—Haulm tall and strong; flowers

coloured; tubers large, skin white and rough, flesh white and of superior quality when cooked.

Up-to-Date.—Haulm tall, strong, and branching; flowers coloured; tubers large, oval in form, with white, rough skin, flesh also white. A deservedly popular variety with all classes of growers.



Fig. 1266.—Potato—Syon House.

Purslane (*Portulaca oleracea*) (fig. 1267).—An annual, native of India, but naturalized in other countries, including England. It has succulent stems and leaves and small yellow

thinly broadcast, and very lightly covered with earth. For an early supply it is sown under glass, on a gentle hot-bed from December to March. It may be sown for succession in May, June, July, and August.

Seeds should be saved from the most vigorous plants of the first sowing; and as soon as the capsules begin to open, the plants should be carefully cut over, and spread upon a cloth in the sun; the seeds can afterwards be easily separated from the seed-vessels by rubbing with the hands and sifting.

There are three varieties of it, viz. *Green*, which is a robust form of the wild type; *Golden*, with leaves of a yellowish colour; and *Large-leaved*, distinguished by the large size of its leaves and its dense habit.



Fig. 1267.—Purslane (*Portulaca oleracea*).

flowers. The leaves are eaten cooked, or as a salad; they are also sometimes pickled.

Purslane requires a light rich soil and a sunny situation. It should be sown in May out-of-doors, in shallow drills 9 inches apart, or

Quinoa (*Chenopodium Quinoa*) (fig. 1268).—An annual, native of Peru. It has stems 4 to 6 feet high, and arrow-shaped mealy leaves. In the high table-lands of the Cordilleras, at the time of the conquest by the Spaniards, it was almost the only farinaceous seed used as food; and it still forms, together with the Potato, the common food of the poorer inhabitants of those regions. The seeds are used in soups or made into a sort of bread, and are said to be easy of digestion, and in no way prejudicial to the health. By fermenting them together with Millet, a kind of beer is made. The young

leaves form a good substitute for Spinach in summer. They are produced in great abundance, and are said to be good food for cows.

The Quinoa requires a light rich soil and a warm situation. Its seeds may either be sown on a gentle hot-bed in March, for planting out



Fig. 1268.—Quinoa (*Chenopodium Quinoa*).

in April or May; or out-of-doors in April, in drills 2 feet asunder. When the plants are 4 or 5 inches high they may be thinned out to 18 inches apart in the rows, and the thinnings may be planted in rows at the same distances apart; by this mode the plants may be easily propagated. In dry weather water should be given; and if the plants are grown for Spinach, the stems should be topped at the first gathering, to induce them to branch. The leaves may be gathered in succession throughout the summer. The seeds ripen in September.

widely cultivated. "There is no doubt that the species is indigenous in the temperate regions of the old world; but as it has been cultivated in gardens from the earliest historic times, from China and Japan to Europe, and as it sows itself frequently round cultivated plots, it is difficult to fix upon its starting-point" (De Candolle). It is chiefly cultivated for the roots; but the seed-pods, pulled when green, are occasionally pickled, and the seed-leaves are sometimes used as a salad.

The Radish will succeed well in any garden soil that is not over moist or too heavy. For early and late crops a warm sheltered situation should be chosen; whilst for those sown in the heat of summer a rather shady spot is preferable. The ground where the sowing is to be made should be deeply dug, and raked fine. The seed is generally sown thinly broadcast, in beds from 4 to 5 feet wide, with 1-foot alleys between, the soil from the latter being used to cover the seeds, but only lightly. The surface is then raked smooth, and in light soils pressed with the back of the spade. Winter Radishes, however, are best sown in drills 6 inches asunder; but if roots of large size are desired, as much as 9 inches may be allowed. After sowing, the beds should be protected from birds, which are very fond of the seeds.

Where Radishes are not forced, a sowing may be made in the middle of December, if the weather is mild; and immediately after having been sown the seed-beds should be covered with about 4 inches thick of litter, which should not be removed till the plants come up, and then only in the daytime when the temperature is above 32°. The crop, if not destroyed by frost, will be fit for use about the beginning of March; but this greatly depends upon the weather.

A sowing, to be treated in a similar manner, may be made in the course of January, weather permitting, and another in February. With the Parisian market-gardeners this is the first crop of Radishes raised out-of-doors. For this sowing they form a bed by digging a trench 18 or 20 inches deep, and filling it up with from 14 to 18 inches of dung, which is covered with 4 inches of vegetable mould. On this the seed is sown; and if the weather is frosty at night the bed is protected with straw-mats. Another sowing, also in a warm situation, may be made in the second fortnight of February, and from that time till the middle of October a small quantity may be sown, in any open situation, every fortnight in spring, and every ten days in the heat of summer.

Radish (*Raphanus sativus*).—An annual,

Lastly, in the end of October, and again in the middle of November, a small sowing may be made on a south border or on a sloping bank. The plants from these sowings must be protected in severe weather with litter, or straw-mats, which should be removed in favourable weather. After sowing, with the exception of thinning out the plants, where too close, to about 3 inches apart, weeding, and frequent watering, no further attention is necessary.

Winter Radishes may be sown in the beginning of July, and again in August, in shallow drills from 6 to 9 inches asunder, and the plants where too close may be thinned out or drawn for use in a young state, so as to leave those which are intended to attain a large size at 5 or 6 inches from each other in the row. The roots are fit for use towards the end of autumn. Those required for winter consumption should be taken up in November or December, before severe frost sets in, and stored in dry sand, like Carrots.

Forcing.—The best sorts for forcing are the Oblong Olive, Early Frame, and the Red and White Turnip sorts. The seeds should be sown in light rich soil, laid to the thickness of 8 or 9 inches on a moderate hot-bed, or in a pit where a temperature of from 55° to 65° is maintained. About an ounce of seeds will be sufficient to sow 25 square feet. If the plants come up too thickly they may be thinned to about an inch apart; afterwards, thinning will be effected sufficiently well by drawing the most forward for use. Gentle waterings should occasionally be given, and air admitted at every favourable opportunity; but the sashes must be covered at night and in frosty weather with straw-mats or other protecting materials. A sowing may be made every fortnight from the beginning of November till the middle or end of February, and the crop will generally be fit for use about six weeks after sowing. Radishes are frequently forced along with Carrots, or between the rows of Endive and Lettuce.

To save Seeds.—Only the finest plants, true to name, should be selected from one of the spring sowings for producing seeds. They should be taken up in April or May, and planted 2 feet apart in well-dug ground, water being given at planting, and subsequently till they take fresh root. The seeds ripen in September, and must be gathered successively as they come to maturity. They should then be dried in the sun, rubbed out of the pods, and stored. They retain vitality for four or five years. Seeds of

winter Radishes are saved from full-grown roots, transplanted in March.

Chinese Rose.—Root somewhat conical, of a bright-rose colour; flesh solid, of fine texture, rather hot.

Chinese White.—Root turbinate, white; flesh tender, excellent, and mild in flavour. The leaves are long, nearly entire, and very unlike those of the other varieties.

Early Forcing (Turnip-rooted forms).—Excellent short-topped varieties of very quick growth, coming into use before any other sort; fine for forcing.

Early Frame (fig. 1269).—Root long, of better shape than the old variety. One of the forwardest of the long



Fig. 1269.—Radish—Early Frame.

Radishes; very crisp and sweet; colour rich-crimson. Quite distinct from Wood's Frame.

Early Gem.—An improved early scarlet, white-tipped, Olive-shaped variety, with an exceedingly small top; well adapted for frame use, as, owing to the almost absence of leaf, many roots may be grown in a limited space.

Early Olive-shaped (Scarlet and White) (fig. 1270).—These two have proved to be among the earliest varieties, and are fit for use five weeks from date of sowing.

Early Rose Globe.—A very early and much-esteemed sort; root slightly ovate, and of a fine clear rosy-scarlet colour.

French Breakfast.—Root oval-shaped, bright-crimson with a white tip; flesh white, solid, and sweet; leaves small. A good forcer.

Golden Olive.—Deserves a place amongst spring Radishes for its pleasing colour; has the great merit of standing through hot, dry weather better than other sorts. Crisp and of good flavour.

Long Purple.—Root long, outside deep-purple; flesh white, and of good flavour. The seed-leaves, which are large, are used as a small salad. An early sort, good for forcing.

Long Scarlet.—Root long, rose-red; flesh white, trans-



Fig. 1270.—Radish—Early Scarlet, Olive-shaped.

parent, crisp, and of good flavour. Much cultivated for the London market. There are several forms of it, such as Scarlet Short-top, Early Frame, and Wood's Early Frame. The best for forcing.

Long Rose.—Similar in shape to Long Scarlet, but comes rather larger, and of a beautiful rose tint.

Long White.—A very handsome white Radish, crisp and tender; appreciated both for its shape and excellent quality.

Scarlet Globe.—Colour brilliant-red; flesh white, mild, and of excellent flavour; remains crisp when other sorts are past. May be had all through the winter.

Scarlet Olive.—Root oval, bright-crimson; flesh rose-coloured, tender, and excellent. It is early, well adapted for forcing, and for the general crops. French Breakfast differs in having the lower part of the root white. *White Olive* is of the same shape and qualities, but the root is shorter and white.

Scarlet Turnip.—Root deep-scarlet; flesh white, sometimes stained with red, of mild flavour. Much cultivated for the London market. Early Scarlet Turnip, the flesh of which is rose-coloured, appears to be a sub-variety. *Purple Turnip* differs only in colour.

Spanish Black.—Root of large size, oval, with a long slender tap-root, outside rough and black; flesh white, hard, and hot. The Purple Spanish or Large Purple is a sub-variety. Sow in the autumn for use in winter.

Spanish White.—Root oval, large, white, tinged with green; flesh white, solid, and hot.

Sutton's Gem (fig. 1271).—Root ovate; suitable for forcing, matures quickly and develops but little leaf; colour rose, tipped with white; flavour excellent.

The Sutton.—In form and colour this long-rooted Radish is distinct from all others. Flesh snowy-white, tender, and delicious in flavour, and the roots remain crisp for a long time.

White Turnip.—Root round, terminating in a small fibrous root, outside white; flesh white, transparent, and of mild flavour. *Early White Turnip* resembles the preceding, but is smaller. An early and excellent variety, very generally cultivated.

Rampion (*Campanula Rapunculus*) (fig. 1272).—A biennial, native of Europe, including Britain. It is cultivated for its fusiform, white, and fleshy root, which is generally eaten raw, but sometimes in a boiled state in salads; the leaves as well as the roots are occasionally used in winter salads.

It prefers a rich, light soil and a shady situation. It is raised from seeds, sown any time between March and July; but if sown earlier than the end of May the plants are apt to run to flower the same year, and when this is the case the roots become tough and unfit for use. The ground should be well dug, and raked as fine as possible; the seed may then be sown either broadcast, or in drills 6 inches apart and about $\frac{1}{4}$ inch deep, formed by pressing the angle of a measuring-rod upon the ground. As the seeds are very small it is advisable to mix them with fifteen or twenty times their bulk of fine sand, in order to ensure their even distribution in the drills, and to prevent the plants from coming up too closely. The seeds should be



Fig. 1271.—Radish—Sutton's Gem.

slightly covered, and be frequently watered till the plants come up, which will be in about a fortnight. When they are an inch high they should be thinned out to about 4 inches apart;

after this no further care is necessary than to water frequently, and to keep the ground free of weeds. Small sowings may be made in the



Fig. 1272.—Rampion (*Campanula Rapunculus*).

end of June and July, in case the plants from the May sowing should run.

The roots will be fit for use from November till April or May, and they may either be pulled up as wanted or taken up in bulk and stored in sand. The plants send up flower-stalks about 2 feet high, which bear small blue or white flowers in July and August. The seeds ripen in autumn.

Rhubarb (*Rheum*).—The genus *Rheum* consists of about twenty species of stout, large-leaved herbs with woody large roots. They are all natives of Central Asia and the Himalaya. The varieties of Rhubarb grown for culinary purposes in Great Britain and North America are said to have sprung from *R. Rhaponticum* and *R. undulatum*, both natives of Siberia and grown in this country since 1573. The use of the leaf-stalks for making tarts, &c., is of comparatively recent date, and is as yet scarcely practised on the Continent. They are much appreciated by Britishers, however, both on account of their flavour, and also as wholesome food. They form an excellent substitute for fruit in tarts and pies. They also make a delicious preserve, and a wine is obtained from them.

Rhubarb succeeds best in a rich deep soil, rather light than otherwise, and well exposed to light. It may be raised from seeds sown in spring, but the mode of propagation generally adopted is by dividing the roots, a bud, of which there are several on the crown, being preserved to each piece.

The ground having been deeply trenched, and well manured with rotten dung, the divisions of the roots may be planted with the bud about 2 inches below the surface, 3 feet apart, in rows from 3 to 4 feet asunder, according to the variety planted and the quantity of ground at disposal. The plantation should be made as early in spring as the weather and state of the ground will permit.

No leaves should be removed the first year, but in the following spring an ample supply may be obtained. In gathering for use the leaf-stalks should be bent down, and pulled, not cut off. The flower-stems, if seeds are not required, should be cut off soon after they make their appearance. In other respects the culture in this, and every succeeding year, is the same as before. Some well-decomposed dung may, however, be dug in when the ground is stirred. Plantations will continue in good production for several years, but it is advisable to make a new one every fourth or fifth year, otherwise the produce is inferior in size and quality to that obtained from ground more recently planted. Some sorts of Rhubarb will, however, continue in good bearing for twelve years or more, if supplied with manure.

Forcing.—Rhubarb is forced in the open ground, or in pits, cellars, or other structures, where a sufficient degree of heat is maintained. In the open ground forcing is frequently effected by covering the roots with Rhubarb Pots (fig. 1273), boxes, or flower-pots, which are afterwards

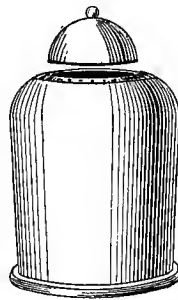


Fig. 1273.—Rhubarb Pot.

surrounded with hot dung or a mixture of litter, stable-dung, and leaves. Another mode which is pursued by the market-gardeners near London consists in digging long pits, to the depth of 2 or 3 feet, introducing 18 inches of hot dung, and then packing the roots closely together in fine soil, covering the crowns with hoops, or with 6 inches of straw, then hurdles or mats, and finishing with 6 or 8 inches of straw, the amount of the latter depending on the severity of the weather. In this way, provided the weather is dry, stout, tender, bright-red stalks are produced, and the leaf-blade is always small.

These methods are, however, attended with considerable trouble and expense, and give the ground a littery and unsightly appearance; moreover, the quality of the produce is frequently

much deteriorated by wet. For these reasons, forcing in houses is greatly to be preferred; not only is the heat more at command, but the quality of the produce is not influenced by the state of the weather. Rhubarb may be forced in any

Champagne.—A superior early variety, producing good-sized straight stalks of a bright-crimson colour; flavour distinct.

Early Scarlet.—Stalks a deep-red colour; suitable for market-gardeners.

Elford.—Well adapted for forcing. Stalks slender, with a thin, bright-scarlet skin; red throughout when cooked, if not peeled, which is not necessary. Even when grown in the dark the stalks still preserve the crimson tinge.

Guava.—A variety of excellent quality, raised by Dr. Maclean.

Linnaeus.—A very good early sort of fine quality. First-rate for main crop; very productive.

Mitchell's Royal Albert.—Very early; stalks large, red, and of excellent flavour.

The Sutton.—Resembles *Victoria* in growth, but comes earlier into use, and is practically a non-seeding variety—a very impor-

tant point. The most striking merit, however, is its beautiful colour when young—a rich bright-red; and this characteristic remains after cooking, even when the roots have been forced in absolute darkness. The stalks are large and tender.

Tobolsk.—Early, and good for forcing.

Victoria.—About a fortnight later than *Linnaeus*; stalks rich-crimson, long and thick, of good quality.

Rocambole (*Allium Scorodoprasum*).—A perennial, native of South Europe. Its bulbs are milder than those of Garlic, and are used for similar purposes. The hulf consists of several cloves; but the stem, which rises to the height of about 2 feet, also produces a cluster of bulbils. The cloves should be planted 2 inches deep, in rows 8 inches apart, and 6 inches asunder in the row, in well-dug ground, in February or March, or after the leaves have died down in autumn. All the culture necessary is to keep the ground clean. When the leaves begin to decay, the bulbs should be taken up, dried in the sun, and stored for use. Some may also be drawn for use before they are full grown.

Rosemary (*Rosmarinus officinalis*).—An ever-green undershrub, native of South Europe. Though not employed in cookery, this plant is grown in every kitchen-garden. A decoction of the foliage is employed to relieve headaches, and is very efficacious in promoting the growth of the hair and in curing baldness. It is likewise used in the manufacture of Hungary water and Eau-de-Cologne. The sprigs are sometimes used as a garnish and for seasoning.

Rosemary requires a light dry soil and a warm sheltered situation. It is propagated by cuttings or rooted slips taken off in April or May, or by

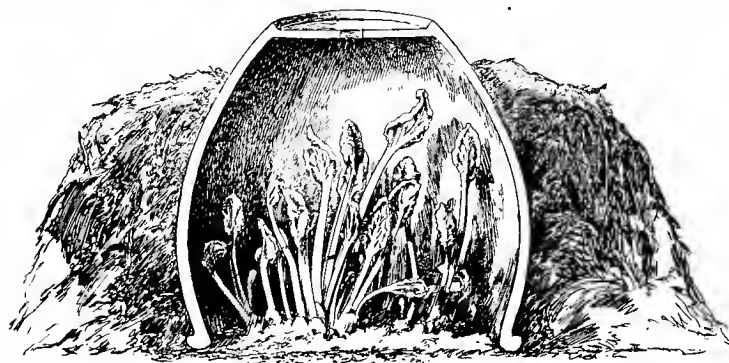


Fig. 1274.—Section of Rhubarb Forcing-pot with Manure.

structure where a temperature of from 55° to 65° is maintained; a Mushroom-house, the floor of a vinery or Peach-house, or a pit, will be very suitable. Where there is not accommodation of this description, the roots may be placed on dung beds in a shed, or even in a warm cellar. The red-stalked varieties are greatly improved in appearance and quality when forced in the dark. Roots from two to five years old are the best for forcing, but in default of such, strong roots of one year's growth may be employed. The reason of the preference being given to the former is that they contain a greater amount of organizable matter for the formation of leaves and stalks. They may be taken up carefully any time after the decay of the leaves, and placed close together in the spot where they are to be forced. Some light soil should then be worked in among them, and a thin layer of soil spread over the whole, in order to retain a sufficient amount of moisture for vegetation. Afterwards, if the soil become too dry, a gentle watering may be given. No other care will be required. Sometimes the roots are taken up in autumn, potted, or more frequently packed close together in boxes, and kept in a shady situation till required for forcing, when they are placed in a Mushroom-house or vinery. In this way, by bringing in a quantity of roots every three weeks, a constant succession is secured with little trouble.

Forcing may be commenced in the end of November, and continued till a supply is produced in the open ground. The older clumps are usually destroyed after they have been forced, but the younger ones may be replanted and forced again two years later.

layers. The rooted slips may be planted at once where they are to remain. The cuttings, which ought to be 5 or 6 inches in length, should first be planted 3 or 4 inches deep in a rather shady situation, where they may remain till the beginning of September, by which time they will have taken root. They may then, or in the following spring, be finally planted 2 feet apart.

Rue (*Ruta graveolens*) (fig. 1275).—An evergreen undershrub, native of South Europe. The leaves have a nauseous smell, and a hot, bitter taste. They are sometimes employed as a garnish, and are administered to poultry affected with the roup. Also used as a popular medicine.



Fig. 1275.—Rue (*Ruta graveolens*).

This plant grows well in any soil, but is not so liable to be injured by frost in poor soil as in a richly manured border. It may be propagated in March or April by seeds, cuttings, and slips; the last is the method generally adopted. The seeds may be sown broadcast, and raked in; and when the young plants are 3 or 4 inches high they may be planted out where they are to remain. The cuttings, or slips, should be planted deeply in a shady border till they have taken root, after which they may be transplanted in rows 18 inches apart, and 8 inches asunder in the row. It is advantageous to cut down a portion of the plantation every third year, to cause the production of young shoots.

Sage (*Salvia officinalis*).—A hardy evergreen under-shrub, native of South Europe. The

leaves are much used in cookery, and were formerly in demand for a decoction known as Sage tea.

Sage grows well in most soils and situations, but succeeds best in a light, warm, and rather dry soil. It may be raised from seeds sown on a gentle hot-bed in spring, and when the young plants are well-rooted they should be hardened off, taken up with balls, and planted 1 foot apart, in rows 18 inches asunder. Sage is, however, seldom raised from seeds, being generally propagated by cuttings or slips of the young shoots taken off in April, May, or June. The lower leaves should be cut off, the cuttings inserted in a shady border, and a hand-glass placed over them, or they may be planted at once in any vacant frame. Water must be given at planting if the soil is not sufficiently moist, and occasionally till they strike. They are then hardened off, and planted out at the distances previously indicated. It is a good practice to pinch off the extremities of the shoots to prevent the plants from flowering, and to induce them to throw out laterals and become compact bushes. The plants require an occasional trimming to make them grow close and bushy. The ground should be kept free of weeds, and stirred in spring and autumn. Sage will live for a long time in the same place; but as the plants become naked and straggling with age, a fresh plantation ought to be made every three or four years. In gathering, the young side and top shoots should be taken, and a quantity should be cut just before coming into flower and dried for winter use.

Salsafy (*Tragopogon porrifolius*) (fig. 1276).—A hardy biennial, native of Europe. It is cultivated for its long, tapering, fleshy root, which is yellowish outside and white inside, larger than that of Scorzonera, and not so liable to fork. The roots are scraped, cut into pieces, and steeped for a while in vinegar; they are then boiled in water like Parsnips, and served up with melted butter, white sauce, and in various other ways. They are also fried in butter after boiling, and served with Parsley. The stalks are sometimes cut when 4 or 5 inches long, and dressed as Asparagus, and in this way they are excellent.

Salsafy requires a free rich soil which has not been newly manured, and an open situation. The ground where it is to be grown should be trenched 2 feet deep in autumn, or at least dug two spades deep in order that long straight roots may be formed.

The seeds should be sown thinly in drills 1

inch deep and 1 foot apart. A first crop may be sown in March, the main one the end of April, and a small sowing the end of May to come in a little later. In dry weather the seed-beds should be copiously watered to induce germination. When the young plants are 2 or 3 inches high, they may be thinned out to 8 inches apart in the row. The ground should be hoed occasionally and kept free of weeds. In October and November roots may be drawn for use, and at the approach of frost some may be taken up and stored in sand for a supply during winter. The roots left in the ground will be fit for use throughout the spring till they run to seed, when they become tough, woody, and useless. The flowers appear in May and June, and seeds are ripened in autumn.

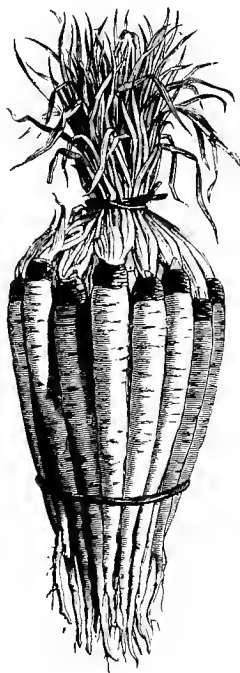


Fig. 1276.—Salsafy (*Tragopogon porrifolius*).

Samphire (*Crithmum maritimum*) (fig. 1277).—A hardy perennial, native of Europe, includ-



Fig. 1277.—Samphire (*Crithmum maritimum*).

ing Britain, where it grows naturally on rocks near the sea. The stem is about a foot high; the leaves are lanceolate and fleshy, and the

flowers are yellow. The leaves, pickled in vinegar, are used in salads and as a seasoning. The plant is difficult to cultivate in gardens, and the produce is never so good as that obtained from the places where it naturally grows. Propagated by division, or by sowing seeds in April, or in autumn soon after they are ripe; the latter period is preferable, for if kept till spring the seed do not germinate so well.

Samphire succeeds in a light sandy or gravelly soil, kept constantly moist, and sprinkled occasionally with a little sea-salt or barilla, or watered with a solution of these substances in order to supply the plant with soda, which is a necessary element of its food. It will grow still better if planted or sown among stones at the foot of walls, with a south or east aspect; this, and an occasional watering with a solution of sea-salt, will give conditions nearly the same as those under which the plant naturally grows. As it is rather delicate, and liable to be injured by frost, it should be protected with dry litter or leaves during the winter. Towards the end of summer, leaves may be cut for pickling. The seeds resemble those of Fennel, but are larger; they ripen in autumn, and do not usually germinate when over a year old.

Savory (*Satureja*).—The aromatic tops of Savory are put into salads and soups; they are also boiled along with Peas and Beans.

Two species are cultivated—Summer Savory and Winter Savory.

SUMMER SAVORY (*Satureja hortensis*) is a hardy annual, native of South Europe. It is raised from seeds, which should be sown on a warm border in April in shallow drills 1 foot apart, thinning out the young plants when 2 or 3 inches high to 6 inches asunder in the rows: the thinnings may be planted at the above distances, and watered at planting, and till they take fresh root. When just coming into flower, a quantity should be pulled up, dried in the shade, and preserved in packets for winter use.

WINTER SAVORY (*Satureja montana*) is a hardy evergreen under-shrub, also native of South Europe. It may be raised from seeds sown in April, but is generally propagated by dividing the plant in March or April, or by cuttings of the young shoots taken off in April and May, and planted on a shady border. When well-established they may be planted out 1 foot apart in rows 15 inches asunder. Some may also be planted as an edging. The plants should be trimmed every year in autumn, and the ground between the rows occasionally stirred, care being

taken not to injure the roots. Fresh plantations should be made before the plants grow old and cease to produce leaves freely.

Savoy (*Brassica oleracea bullata*).—The Savoy differs from other Cabbages in having puckered or crimped leaves, which form one large, usually wide-spreading head with a hard, often large "heart"; the stem is short.

The Savoy succeeds best in a moderately rich soil, neither very stiff nor too highly manured, and in an open situation. For a supply in the end of autumn, and throughout the winter, three sowings will generally be sufficient; namely, one towards the close of February for an early crop, another in mid-March, and a third in mid-April. Sometimes also some seeds are sown in the beginning of August for plants to come in early the next autumn; but in spring a sowing of some early sort, such as the Earliest of All, is preferable.

The ground for the seed-bed having been prepared, the seeds are sown broadcast or in drills, and in light soils the surface is pressed with the back of the spade. When the young plants have made two or three good leaves, they should be pricked out 3 inches apart into nursery-beds. In May some of the most forward plants of the early sowing may be planted out for use in September if this vegetable is required so early; the remainder may be transplanted in the course of the month of June. The main crop and latest sowing may be planted out in July and August, when rain is likely to fall. In all cases the strongest plants of the respective sowings should be planted out.

On taking up the plants, their roots should be examined in order to ascertain whether they are clubbed or not, and all that exhibit any signs of that disease should be rejected. The distances at which the plants may be placed varies with the sort and the nature of the soil; less space being required in poor than in rich soil. Small kinds, like the Early Ulm, may be planted 12 inches apart in rows 15 inches asunder; whilst for the Large Green and similar sorts the distance should be increased to 2 feet each way. Sorts of medium growth may have the above distance between the rows, whilst 18 inches may be allowed between the plants in the rows. After planting, if the weather be dry, the plants should be watered, and this ought to be continued till they are again established; afterwards all the culture required is confined to hoeing the ground occasionally.

Except in very severe winters, Savoy do not

require protection from frost; sometimes, however, the plants are made to incline towards the north, and the earth taken from that side placed over the roots on the opposite side. The late crop remains fit for use till the end of February or later.

Seeds are saved in the same way as advised for the Cabbage; they ripen in the months of July and August.

The principal sorts are:—

Best of All.—A superior Savoy of the Drumhead type. Hearts solid and well formed; suitable for large establishments. The chief merit of this variety is its excellent table quality, in which respect it resembles the better garden Cabbages.

Bijou.—A most attractive small Savoy. It possesses all the good points of Tom Thumb, but offers the advantage of coming in very late. Leaves elegantly curled.

Dwarf Green Curled.—Stem dwarf; leaves deep-green, very rugose, much curled at the margin; hearts well, and is very good, especially when mellowed by the first frosts in autumn.

Earliest of All (fig. 1278).—The earliest Savoy in cultivation. Seeds sown on March 20 produced a fine crop ready for cutting about August 5. Hearts conical in shape, close and compact; leaves pale-green; very tender and sweet.

Early Ulm.—Heart small, round; outer leaves forming a cup, with the edges rolled a little outwards, of a deep-

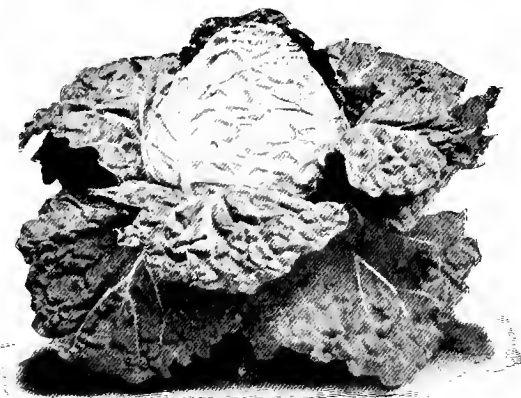


Fig. 1278.—Savoy—Earliest of All.

green colour. It hearts quickly, is of excellent quality, and is a good second early sort.

Large Green German (Drumhead).—The largest Savoy, and one of the best. The leaves are plainer than in the other varieties; the heart roundish, a little flattened, like a Drumhead Cabbage. It withstands frosts very well.

Marcelin.—Like Early Ulm, but larger and not so early. Leaves dark-green, finely wrinkled and curled; heart round, compact, and of excellent quality.

Perfection (fig. 1279) combines the best points of older varieties, but surpasses them all in degree of excellence. The plants are not more than 9 inches high, having but few outside leaves, which are beautifully curled.

Tom Thumb.—One of the smallest Savoy known. Hearts compact, and delicate in flavour. Especially use-

ful in gardens of limited extent, as it may be planted a foot apart each way.

Yellow Curled.—Dwarf, round; leaves pale-green or yellow. The heart is not so compact as some, but it is

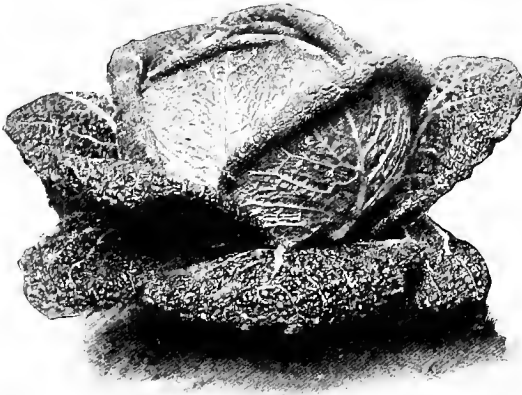


Fig. 1279.—Savoy—Perfection.

tender and much sweeter than the other kinds. It is later and hardier than the other yellow Savoy.

Scarlet Runner (*Phaseolus multiflorus*).—A half-hardy perennial, native of South America. Being commonly grown in cottage-gardens, both for use and ornament, it is well known to everyone. It is not, however, so generally known that the plant is a perennial, having tuberous roots like the Dahlia; and that these, after having been preserved through the winter in a dry place out of the reach of frost, and planted out in spring, will yield a crop earlier in the season than that afforded by plants raised from seeds. It may be observed that the roots of the Scarlet Runner are very poisonous.

Cultivation.—The soil should be rich, rather deep, not dry and thin, and by no means cold and wet. As the plants are too tall and rambling for borders, the seeds should be sown in the open quarters; and as they are not required so early as Kidney-Beans, which are better adapted for affording an early supply, the crop of runners need not be risked by sowing too early.

During a hot and dry summer abundance of moisture must be supplied to the roots, and in the case of shallow, light soils, trenches should be prepared as for Celery, and the seeds sown over these. Either this plan or that of drawing up the soil on both sides of the rows so as to form a trough, renders watering a comparatively easy matter, every drop of water, sewage, or other liquid manure applied reaching the roots.

The first week in May will be soon enough

for the first sowing. If the seeds germinate well, and be likely to go on favourably, another sowing need not be made till the beginning of June; but if they are checked by cold weather, another sowing should take place in the third week in May, or as soon as the weather is favourable. Two or three sowings will generally be sufficient, namely, one in the beginning of May, another in the end of that month, and a third in the middle of June. Plants raised from these sowings will afford green pods till destroyed by frost.

Scarlet Runners are grown in various ways. A common method in the large market-gardens near London is to sow at from 8 to 12 inches apart, in rows 3 or 4 feet asunder, according to the richness of the soil. The plants are not supported by sticks, but kept dwarf by pinching or cutting off the tops at the second or third joint, all other running shoots being also kept closely snipped off with a pair of scissors or the finger and thumb. Unless this stopping is very closely and persistently practised, there will soon be a thicket of growth and very few pods produced. A mulching of strawy litter keeps the pods from being badly splashed and also prevents the soil from drying.

For private gardens the plan of growing these Beans in rows at wide distances apart and trained on tall stakes is the best. Under liberal culture they attain a great height, or as much as 20 feet, and in some instances they are actually given stakes 12 feet and upwards in height. These tall stakes, with their heavy burden, are, however, liable to be blown about by strong winds, and, moreover, very high steps are needed to gather the pods. As a rule strong stakes, from 6 to 9 feet out of the ground, and well braced together near the tops with the aid of other stakes and tar twine, are more to the purpose, and the rows in this case should be not less than 6 feet apart. This may seem somewhat extravagant, but two rows of early Potatoes, or of Cabbages and Cauliflowers, could be planted early between the rows of Beans, or what are intended as such, while the latter will crop all the more heavily for having plenty of room.

Another method is largely adopted in the home counties and elsewhere. Instead of sowing the seeds in single lines, they are sown in double lines about 1 foot apart, and in each line stakes are inserted so as to cross each other at about 18 inches from their tops. These again are strengthened by having a line of stakes connecting them together where they meet, and such

an abundance of pods do these double rows give that two of them 20 yards long are ample to meet the requirements of a moderately large establishment. Avoid overcrowding, and pinch out the points of running growths when these have reached the top of the stakes.

The sticks require to be strong, otherwise, when loaded with the plants, high winds sway the whole to one side. In many cases such sticks cannot be procured; when this is the case it is a good plan to sow in patches or circles of about 2 feet in diameter and 6 feet apart, six seeds being placed in the circumference of each circle. Three sticks, on which the branches and twigs are retained, should be stuck in at three equidistant points, just outside the circle, and their tops brought together and tied. Secured in this way, the sticks will afford good support. The ground can also be planted with some crop, such as Broccoli, between the Beans.

Runner Beans transplant readily, and blanks may be filled up accordingly from where the plants are the thickest, or a number of plants may be quickly raised in boxes and pots in gentle heat, and after being duly hardened off, may be planted out where they are required. Very early rows should be protected with strips of cotton netting, canvas, or mats, supported by benders.

If the roots are packed away like Dahlia roots, and replanted in March, 6 inches apart, in rows 5 feet asunder, they are likely to yield a crop much earlier than plants raised from spring-sown seeds. They are, however, rarely resorted to.

When the plants are growing slowly, or whilst the soil and air are colder than is congenial to them, they will not require much water; but when in vigorous growth, and the pods are forming abundantly, plenty of water should be supplied, but not from a cold spring. Earth should be drawn to the stems, as directed for Kidney-Beans. In training straggling shoots to any support that may be employed they should be directed from right to left, or contrary to the course of the sun. If turned otherwise they will not go on. Gathering the crop and saving seeds are conducted as for the Kidney-Bean.

The varieties generally cultivated are:—

Chelsea Giant White.—Remarkable for its free-cropping habit and continuous bearing, as well as for its gigantic, thick, fleshy pods, often measuring 15 inches in length, which are proportionately broad and of splendid table quality.

Mammoth Scarlet.—Surpasses all the older sorts in size

and quality. It is abundantly prolific, bearing in clusters enormously long, broad, thick fleshy pods of a dark-green colour, which when cooked are particularly tender.

Ne Plus Ultra.—Flowers scarlet; pods long, perfect in form and of excellent quality. A heavy cropper; a favourite with growers for market.

Painted Lady.—Flowers bright-scarlet and pure-white; very ornamental; but as regards quality and productiveness is scarcely equal to Scarlet Runner.

Scarlet Runner.—Grows from 9 to 12 feet high. Flowers scarlet; seeds dark-red; pods rough on the outside, and on that account less esteemed than Kidney-Beans; nevertheless they are tender when cooked.

Sutton's A 1 (fig. 1280).—This can easily be distinguished from other varieties by the darker colour of its leaves and flowers. The deep-green pods, which hang in

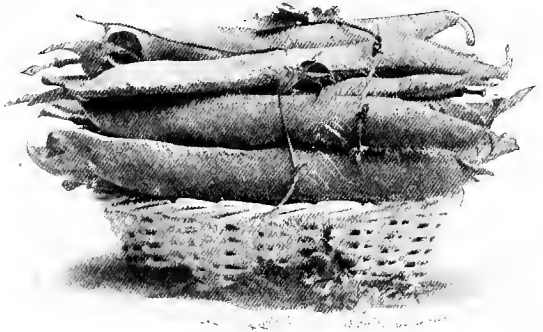


Fig. 1280.—Scarlet Runner—Sutton's A 1.

great clusters, are straight, fleshy, and of immense size; when cooked they are tender and of excellent quality.

White Runner.—A variety with white flowers and seeds; it does not continue so long in flower and bearing as the Scarlet, which is therefore the more useful of the two; its ripe seeds are preferred to those of the Scarlet by the French. For ornament a few of the white may be intermixed.

Scorzonera (*Scorzonera hispanica*) (fig. 1281).—A hardy perennial, native of Spain. The root, for which the plant is cultivated, is Carrot-shaped, black outside and white inside. It is cooked in the same way as Salsafy.

Scorzonera succeeds best in a light, deep, free soil, and an open situation. It is raised from seeds sown in drills 1 foot apart, and covered to the depth of $\frac{1}{2}$ inch. As it is apt to run to seed if sown too early, and consequently, to become tough and woody, it is better not to sow till the end of April in the hotter parts of the kingdom; elsewhere it may be sown in the end of March. A second sowing may be made in May. The young plants, when 3 or 4 inches high, should be thinned out to 8 inches asunder in the rows. In September, some of the roots will have attained sufficient size to be drawn for immediate use; others will come in for use in October and November. In the latter month

they will be in perfection, and before frost sets in a quantity may be taken up and stored in sand for a supply during its continuance. At other times the roots remaining in the ground



Fig. 1281.—*Scorzonera* [*Scorzonera hispanica*].

will afford a supply throughout the winter and spring, and will continue fit for use till April or May, about which time the plants begin to run to flower. Before this takes place any roots remaining in the ground should be taken up and placed in sand. The seeds ripen in autumn, and are best when saved from plants two years old.

Sea-Kale (*Crambe maritima*) (fig. 1282).—

A hardy perennial, native of Europe, including Britain, where it grows on the sea-coasts. It has been cultivated for more than a century, but most extensively within the last fifty years. Formerly the green leaves were used boiled as greens; but now the young blanched shoots are the parts used, and the chief aim in its cultivation is to produce them large, crisp, and well blanched.

Soil and Situation.—The situation for a plantation of Sea-Kale should be open to the sun, and not under the drip of trees. The best soil is a rich, deep, sandy loam, but the plant will succeed in any good garden ground that is not stiff. The kinds of manure here recommended for Asparagus will also be suitable for Sea-Kale.

The ground should be trenched to the depth of from 2 to 2½ feet, and according as it is poor or rich, more or less farmyard or other manure should be well incorporated with it.

Cultivation.—Sow in rich soil in March, or as early in April as possible, in rows 1 foot asunder, and thin the plants to 6 inches apart in the rows. Stir the ground, and keep the plants clear of weeds during the season. Towards midsummer, a sprinkling of salt or of nitrate of soda may be applied with beneficial effects. Either of these salts may be sown over the leaves of the plants as well as on the ground, and no injury will result.

In the following March, the ground being trenched and duly prepared, commence at 2½ feet from the side of the quarter, and mark three rows at 2½ feet apart. Then a 3-foot space should be allowed; and again three rows should be marked off at 2½ feet apart, and so on. If ground is scarce, it will nevertheless be advisable to retain the distance of 3 feet between every third and fourth row; but between the others an interval of only 2 feet may be allowed. This distance will also be proper for a plantation which is to be forced, only the plants should be 2 feet apart in the row, in order to admit of blanching pots being placed over them.

When the plants are taken up, the top of each with all the crown-buds should be pared off. If this precaution be not taken, the plants would be apt to run to seed in the first summer after planting; but when the crown is cut off, several buds will push which will not have this tendency. A trench about 1 foot deep should then be made by the side of a line, and the plants inserted so that their crowns may be about 2 inches below the surface. Watering after planting is not required, at least till the plants have struck fresh root.

After planting, the growth of the plant should be promoted as much as possible, and with this view a mulching of rotten dung may be applied, or liquid manure may be occasionally given. The flower-stems, if any push, should be cut off as they appear. Buds will be formed in the axils of each leaf, and in the spring of the second year of planting they will form a sprout which becomes fit for use when blanched, and of course the larger and more vigorous it is the better. Its strength greatly depends on that of the bud, and this again on the size of the leaf in the previous autumn; efforts should therefore be made to grow only large leaves. In order to do this it is advisable to make an early removal of some of the weaker ones, so that a limited number

may have more light and air. If some very large sprouts are intended to be grown, the plants should be kept far apart. In the autumn the leaves should be removed as they decay, and, when all are cleared off, the ground should be forked over, and a covering of leaves 6 or 8 inches thick placed over the plants, and on

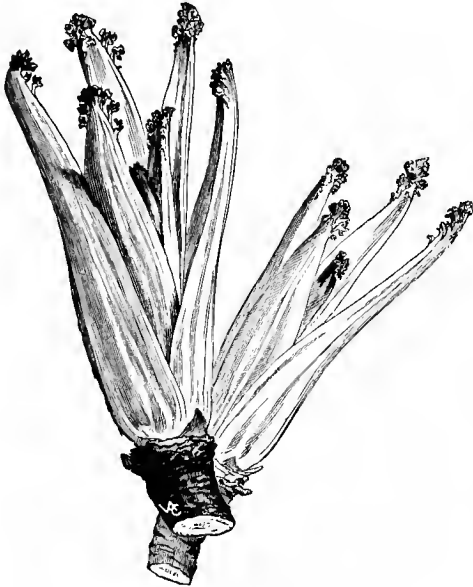


Fig. 1282.—Sea-Kale (*Crambe maritima*).

this some litter should be put, to prevent the leaves from being blown away. If leaves are not at command, the plants may be covered with a layer of light soil, and by this means they will be blanched, though not forced.

Instead of sowing the seed in a nursery-bed, and transplanting the year-old seedlings, some prefer sowing in patches, at the proper distances, where the plants are to remain for produce. This is certainly the more natural mode, and well-established plants can be obtained by it; the only objection is the loss of the ground for a year. The plants should be allowed to follow their natural mode of growth during the first summer; but after the winter is over, the crowns of every plant should be pared off, as was recommended in transplanting, to prevent the formation of flowering stems. In the second spring after sowing a portion may be forced or merely blanched if required.

Plantations are now generally made from root cuttings, for any part of these will push shoots and form a plant. The extremities of the roots of plants taken up for forcing in November, or subsequently, answer very well. Being the younger portions of the roots, they ultimately

make better plants than would result from transplanting the older and thicker parts. These *thongs*, or extremities of the roots, should be taken only from healthy plants, and should be about 4 inches in length, cut flat at the top or thickest end and slanting at the other end, and then tied in bundles of fifty. By the middle of April they will have commenced sprouting and forming roots, when they ought to be planted with a dibber 15 inches apart in rows 20 inches apart, taking care to sink them just below the surface. Most of the cuttings will attempt to push out several sprouts, but these must early be thinned to a single growth in each case, otherwise the crowns will be small. Should the weather be dry during the first few days after planting, water ought to be given, but after they are once growing strongly, merely keeping the surface of the ground free of weeds by means of an occasional hoeing will be all that is needed to produce fine crowns for lifting and forcing; they may be lifted and stored in sand or moist soil till wanted, or until planting time in spring.

Forcing.—Sea-Kale is easily forced either in mild hot-beds, frames, benders and mats, or in Mushroom-houses, where it can be kept in darkness. Batches of roots can every few days be packed together closely in rich loamy soil, and will produce fairly strong growths in the course of about three weeks—more or less according to the heat kept up. If placed near to hot-water pipes the soil should never be allowed to become dry, and a second cutting of serviceable growths may then be had.

A little heat is sufficient to excite vegetation, for, with a mean temperature of 42°, it pushes naturally in the open ground, and when the mean of the air and of the soil reaches 55°, the growth is as vigorous as can be desired, and therefore, in forcing, this mean temperature ought not to be exceeded. In cases of emergency, when produce must be had in a certain limited period, 60° may be applied; but this should be the maximum.

If forcing is to be carried on where the plants are established in the open ground, the soil ought not to be allowed to get frozen in the autumn or winter previous to forcing. It is easy to prevent this by a covering of litter; but if the soil is allowed to get frozen, it takes much heat to raise the temperature to even 42°, which we may term the starting-point in forcing this vegetable, for at this temperature it will be in a manner dormant. Top and bottom heat should correspond, for at the time of the year

when Sea-Kale pushes naturally, the average temperature of the air and that of the earth very nearly correspond. In commencing to force we may raise the bottom-heat 5° , or to 47° the first week, to 50° the second week, and then increase it by 1° a week till produce fit for cutting is obtained, which will be in the course of six or seven weeks from the commencement of the process.

The time to commence forcing depends on the period at which produce will be required. If this should be the third week in December, from plants forced in the open ground, they must be cleared of decaying leaves in the end of October, and the soil about the crowns forked over and made fine. A portion of the plants may be covered to the depth of several inches with light soil, sand, or coal ashes, and a succession to those which are not so treated will by this means be secured. The others should be covered with Sea-Kale pots (fig. 1283), or large garden pots, and over these must be laid a covering of stable manure, or, preferably, a mixture of manure and leaves.

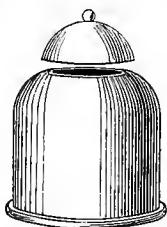


Fig. 1283.—Sea-Kale Pot.

Taking the Crop.—The blanched sprouts should be cut when they are from 3 to 6 inches in length, and whilst crisp, stiff, and compact; they should not be left till they are drawn up so as to bend or hang down. The soil or other material used for excluding the light should be carefully removed so as to expose the stem of the sprout, and the latter should be cut a little below the base of the petioles, and just enough to keep these attached. After the crop has been taken the plants should be exposed and the shoots thinned to 3 or 4 crowns on each plant.

To save Seeds.—Select some strong plants, and allow them to take their natural growth, without cutting off the crowns, or blanching. When the seeds are ripe, collect the pods, dry them, and put them into open canvas bags. The seeds keep best in the pods.

Varieties.—Formerly there was only one form, the Purple-tipped, but we now have the Lily White variety of this. In some respects the latter is a great acquisition, inasmuch as it requires less blanching, the tips being creamy-white, while the flavour is also more delicate than is the case with the old form. Unfortunately the Lily White is less hardy, and the crowns should either be protected from frosts

where grown, or else be early lifted and stored for use as required.

Shallot (*Allium ascalonicum*).—A hardy perennial, native of Palestine, near Ascalon; hence the specific name. The bulbs, which are milder in flavour, and do not possess such an offensive odour as those of Garlic, are used in a raw state for flavouring steaks and chops; they are also boiled in soups, stews, and some other dishes, and are excellent when pickled.

The Shallot requires the same treatment as Garlic. In recently manured and damp ground it is liable to be attacked by the maggot and a kind of mould; and in any case it is well, in planting, to leave the points of the bulbs a little above the surface. A small plantation may be made from the middle of October to the middle of November, in order to produce bulbs in June and July, but the principal crop should not be planted till February or the beginning of March. When the roots have taken good hold of the ground, it is a good practice to remove the earth from about the bulbs, so as to leave them wholly out of the ground. In July or August, when the leaves turn yellow, the bulbs should be taken up, and, after having been dried in the sun for several days, they should be placed in nets, or tied up in ropes like Onions, and hung up in a dry airy room from which frost is excluded.

The varieties are:—

Common.—Leaves small, in close tufts, about a foot in length. Bulbs long-oval or conical, reddish-yellow. Early and long-keeping. It seldom runs to seed.

Grosse Echalotte d'Alençon.—Bulbs of the same shape and colour as those of the Jersey Shallot, but larger and later in forming; the leaves are longer and more glaucous. The largest kind, but it does not keep well.

Jersey or Russian.—Leaves short, very glaucous. Bulbs round, small-necked, yellowish-red. The earliest kind, but apt to run to seed when planted in autumn.

Skirret (*Sium Sisarum*).—A perennial, native of China and Japan. The root, which is the part used, is composed of several prongs about the thickness of a finger. They are boiled, and served in the same way as Salsafy and Scorzonera. The plant is little cultivated. It succeeds best in a free, rich, deep soil, and in an open situation. It is generally raised from seeds, but may also be propagated by side shoots in spring. Seeds should be sown about the end of March or in April, in drills 1 foot apart. In dry weather the bed should be watered, and when the young plants are about 2 inches high they may be thinned out to 6

inches asunder. Some of them may be taken up young in September, and they will be in perfection in November, and continue so till the plants begin to exhibit signs of pushing up flower-stems, when they should be taken up and stored in sand. The flowers, which are white, appear in July and August. The seeds, which ripen in autumn, should only be saved from the plants which flower the second year.

Sorrel (*Rumex*).—The leaves of Sorrel are used in soups, salads, and sauces, especially on the Continent, where they are also used as a substitute for Spinach.

Sorrel grows well in almost any soil, but succeeds best in one that is rich, deep, and rather moist. All the sorts may be propagated by dividing the roots in March or April, and this method is that which must be adopted in propagating the dioecious kinds when male plants are required. The best plants are obtained from seeds sown either broadcast or in drills, on well-dug ground, raked fine, and covered with fine earth to the depth of $\frac{1}{2}$ inch. The distance between the drills may be 15 inches for the small-leaved sorts and 18 inches for the large-leaved kinds. When the young plants are 2 or 3 inches high they should be thinned out to 1 foot apart in the row, and the thinnings may be planted at the above distances, water being given at planting, and afterwards till they take root. About two months after sowing, some of the leaves may be gathered. In doing this, the plants are generally cut over; but the market-gardeners near Paris prefer gathering the leaves singly, always taking those which are full grown, leaving the younger to increase in size; and this is the best plan. As the acidity of the leaves is increased in the heat of summer, a small quantity to come in for use at that season should be sown or planted in a shady and rather moist border. All the care necessary is to hoe the ground between the rows occasionally, to fork it in spring or autumn, and to take up the plants, divide, and replant them every three or four years, or less frequently if they are growing vigorously and produce full-sized leaves.

Three species and several varieties are cultivated:—

Common Sorrel (*R. Acetososa*).—A perennial, native of Britain, where it grows naturally in meadows and pastures. The varieties are:—Common Garden Sorrel, Belleville Sorrel (fig. 1284), Blistered-leaved Sorrel. The second sort is the best, and is the kind generally cultivated near Paris.

French or Round-leaved Sorrel (*R. scutatus*).—A hardy perennial, native of France and Switzerland. Its stem is

from 12 to 18 inches high; the leaves are roundish, heart-shaped, entire, glaucous, and smooth.

Mountain Sorrel (*R. montanus*).—A hardy perennial, native of Europe. There are two varieties, the type and the Green Mountain, both of French origin. The leaves of the first sort are slightly blistered, larger than



Fig. 1284.—Belleville Sorrel.

those of the Common Sorrel, of a paler green, and not so acid. The leaves of Green Mountain possess much acidity, are of darker green, larger, more abundant, and earlier in spring

Spinach (*Spinacia oleracea*).—An annual, supposed to be a native of Northern Asia.

The soil for Spinach should be deep and rich, neither very stiff nor very light. The ground for the summer sowings should be rather moist, otherwise frequent waterings will be necessary; whilst for the winter crops a dry warm spot must be selected. In all cases the ground should be deeply dug, and if necessary manured with stable-dung. Blood, guano, and other nitrogenous manures are also used.

The first sowing may be made in the middle of February, and from that time a small quantity should be sown every three weeks till May, and then every ten days till August if a constant supply is required, for the summer crops soon run to seed. In the first week in August, and again in the third week of that month, the principal crop of Flanders and Lettuce-leaved for winter use should be sown; and lastly, another sowing of the same varieties may take place in the beginning of September. The sowings for summer use should be made in a somewhat shady situation, with the view of preventing the plants from running to seed so soon as they otherwise would. Frequently the summer crops are sown in a single drill between rows of Peas or Beans; in this way they do very well, and in rich soil do not injure the plants between which they are grown.

The ground having been deeply dug, the seeds should be sown in drills about 1 inch deep, 12 inches apart, but for the Flanders and Lettuce-

leaved varieties from 15 to 18 inches between the rows may be allowed. The winter crops are also frequently sown broadcast, in 4- or 5-

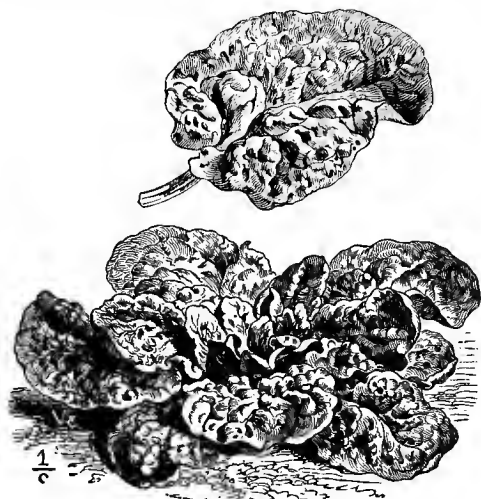


Fig. 1285.—Spinach—Lettuce-leaved.

foot beds, with 1-foot alleys between. Previous to sowing, if the ground is dry, the drills should be well-watered; it is also advantageous to steep the seeds before sowing for five or six hours, when their speedy germination is desired; but in this case they must not afterwards be allowed to get dry, nor suffer from want of water.

After sowing, the seed-bed should be frequently watered in dry weather. When the young plants have made three or four leaves, they should be thinned out to about 2 inches apart; afterwards, when rather further advanced, they may be thinned out to 6 or 9 inches apart in the rows. Some, before thinning the summer crops a second time, make a first gathering, and then cut out every alternate plant. After thinning, the culture is confined to keeping the ground clean, stirring occasionally, and watering frequently and copiously in dry weather. In gathering for use, the largest leaves should be taken off first, either by cutting or picking, the others being left to produce in succession; but during the heat of summer the plants may be cut over.

The varieties are few.

Flanders.—Leaves large, hastate, from 6 to 8 inches in breadth. A hardy and good winter sort.

Lettuce-leaved (fig. 1285).—Leaves very large, rounder than those of the preceding sort, of thick substance, and of a dark-green colour. It is not perhaps quite so hardy as *Flanders*, but on account of its superior quality at least half of the ground allotted for the winter crop should be occupied by it.

Prickly-seeded (Winter).—Readily distinguished by its

seeds being prickly. Leaves smaller and thinner than those of *Flanders* and *Lettuce-leaved*, to which varieties it is inferior in everything but hardiness.

Summer (Round).—Leaves large, roundish, and thick. This sort is adapted for summer use; all the others for winter supply. In consequence of its soon running to seed it requires to be sown frequently.

Tansy (*Tanacetum vulgare*).—A hardy perennial, a native of Europe. The young aromatic leaves are employed in colouring and flavouring puddings, &c.

Tansy may be raised from seeds sown in spring, or by division of the roots in autumn. By topping the plants before they come into flower the production of young leaves will be encouraged. The plants will thrive for many years in the same place.

Tarragon (*Artemisia Dracunculus*) (fig. 1286).—A perennial, native of Siberia. The aromatic leaves and tops are used in salads and soups, are pickled with Gherkins, and an infusion of them in vinegar forms the much-esteemed Tarragon vinegar.

Tarragon requires a free, light, somewhat dry soil, and a warm situation. It is propagated by dividing the roots in March or April, planting them in deeply-dug ground, 8 inches apart, in rows from 12 to 15 inches asunder, covering the roots with soil to the depth of 2 or 3 inches. It



Fig. 1286.—Tarragon (*Artemisia Dracunculus*).

may also be propagated by cuttings of the shoots, taken off in July or August, planted under a hand-glass, and transplanted when they have made good roots, water being given at planting and until they are established. As the plants are liable to be injured by severe frost, it is a good plan to cut them down at the approach of winter, and to cover the crowns with a little mould and then with litter. In spring the ground should be slightly stirred, but not so

deeply as to injure the roots. A fresh plantation should be made every year; for Tarragon, though a perennial, is apt to die off in this climate, seldom lasting good for more than two or three years. Roots lifted in great flakes and placed in boxes of light soil force readily, but where not forced in winter, a quantity of matured growths should be cut and dried for use in that season.

Thyme (*Thymus*).—The leaves and tops of Thyme are extensively used in soups and stuffings, for which purposes two species are cultivated, namely, Common Thyme (*Thymus vulgaris*) and Lemon Thyme (*Thymus citriodorus*).

Thyme is a most aromatic herb. It thrives best when planted in a light, rich, and rather dry soil, and in a warm situation. The best plants are raised from seeds sown in April, on a bed of light earth raked fine. They may be sown broadcast, in shallow drills 8 inches apart, or in a single drill to form an edging; in either case covering lightly with earth. The seed-bed and the young plants, when they come up, should be watered occasionally in dry weather. They may be thinned out in June or July to 4 inches apart; or, if sown in drills, to about 3 inches apart in the row. The thinnings may also be planted, water being given at planting, and subsequently till they take root.

Old plants may be divided in March or April, and rooted branches may be taken off and planted at the same period, in both cases watering at planting. Branches may be induced to take root by bending them down and covering the lower portion with earth, when they will soon take root.

Thyme is frequently planted or sown as an edging, and answers the purpose very well; but after the lapse of three or four years, or when the edging commences to exhibit gaps, the plants should be taken up. When coming into flower a quantity should be cut, or pulled up, and dried for winter use.

Tree Primrose (*Enothera biennis*).—A hardy biennial, native of Virginia, but naturalized in many parts of Europe. It is cultivated in Germany for its long fusiform roots, which are cooked in various ways. The following details respecting the method in which it is cultivated and used in that country are translated from the *Bon Jardinier*:—"It is sown thinly broadcast in April on well-dug ground, and when the young plants have made a few leaves they are planted in quincunx order, at from 12 to 20

inches apart, in ground manured the previous autumn. During the summer the ground is kept clean, and the plants watered when necessary; in the autumn the roots are taken up, deprived of all the leaves, with the exception of the heart-leaves, and stored in a cellar, or they are left in the ground and taken up as required, for the plant is perfectly hardy. The roots are eaten boiled, either cut into slices and put in salad, or served up with white sauce like the roots of Salsafy. They are also put into soups. This vegetable is recommended for weak stomachs, being easy of digestion, and nourishing at the same time. It is not used after Easter, as the roots by that time become hard and woody."

Tropæolum tuberosum (fig. 1287).—A perennial, native of Peru. It produces an abundance of pretty yellow and red tubers, the size



Fig. 1287.—*Tropæolum tuberosum*.

of small Pears, the taste of which is not, however, very agreeable. On this account a particular mode of preparation is adopted in Bolivia, where, according to M. Decaisne, they are treated in the following manner:—

The tubers require to be prepared before they become edible. Indeed, when they were cooked like Potatoes, immediately

after being taken up, their taste was very disagreeable. But in Bolivia, where they have become, if not a common vegetable, at least one which is quite edible, the tubers are frozen after they have been cooked, and are eaten when frozen. In this state M. Weddell affirms that they constitute an agreeable dish, and that scarcely a day passes at La Paz without two lines of dealers being engaged in selling the 'Ysano', which they protect from the action of the sun by enveloping it in a woollen cloth and straw.

The ladies of La Paz are all very fond of the Ysano; and in the season of the *taiachas* large quantities are sopped in molasses, and taken as refreshment during the heat of the day.

This plant may be propagated by pieces of

the tubers in the same manner as Potatoes, an eye being preserved in each piece. The sets should be planted in April, about 4 feet apart, in light rich soil. The stems may either be allowed to trail along the ground, or pea-sticks may be placed for their support; in dry soils and seasons the former method should be adopted; in those which are moist, the latter. The tubers are taken up in October or November, when the leaves begin to decay, and stored in sand.

Truffle (*Tuber aestivum*) (fig. 1288).—A kind of Puff-ball, nearly spherical in shape, which has been known to attain a weight of 3 or 4 lbs., and measure 4 inches in diameter. The surface is rough, warty, and black. The flesh is grayish or white when young, black veined with white when old. The smell is powerful, but by no means unpleasant. It grows from 2 to 10 inches under the surface of the ground, and the spots where it is to be found are discovered by means of dogs trained for the purpose. It is abundant in some parts of Britain, particularly in Wiltshire, Kent, and Hampshire, but it never occurs in any but calcareous soils, where it grows under the shade of trees, generally the Oak and Beech. In warm, moist years it may be found throughout the year, but most abundantly from August to October.

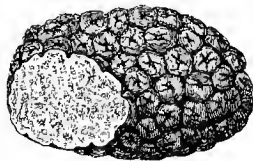


Fig. 1288.—Truffle.

Truffles constitute a much-esteemed luxury, seldom indulged in by any but the rich. They are used in sauces, gravies, and in a great variety of dishes; indeed it is an axiom with first-rate French cooks that the Truffle improves all that it touches. There is, however, no doubt that they are injurious to health when eaten in large quantities.

Turnip (*Brassica Rapa*).—A hardy biennial native of Europe, including Britain. It has been cultivated for its roots from time immemorial, and the leaves are also frequently used as Greens, or sometimes blanched as a substitute for Sea-Kale.

The French Turnip, a fleshy-rooted variety of *Brassica Napus*, which is sweeter and of better flavour than the Common Turnip, but inferior to it in size, is likewise cultivated for the same purposes; and the Swedish Turnip (*Brassica campestris Rutabaga*) is sometimes, on account of its extreme hardiness, grown in gardens in very

cold situations where other sorts are liable to be injured by frost.

Soil and Manure.—The Turnip succeeds best in light sandy soils, and loams containing a large proportion of sand. Stiff retentive soils, on the contrary, are ill adapted for the growth of good crops of well-flavoured roots, and on such also early crops are more apt to run to seed. In light dry soils well-decomposing farmyard dung is one of the best applications that can be made, as it not only affords nourishment but moisture to start the young plants into the rough leaf. For heavy land, littery dung, not much decomposed, may be advantageously employed. Bone-dust, superphosphate of lime, or guano, applied either separately or together with farmyard manure, exercise a highly beneficial effect on the crop, especially in old garden soils containing an excess of organic matter, forcing the plants into the rough leaf, and encouraging the development of the roots.

Culture.—Turnips are sometimes sown broadcast in gardens, and as they are not required to be large, this mode answers very well in light soils. Where the soil, however, is more tenacious, it is a good plan to draw shallow drills with a hoe at about 15 inches apart, which may be watered with guano-water, and the seeds be sown as regularly as possible, then slightly covered with fine soil and rolled.

If young Turnips are required early, some of the Early Milan may be sown in a warm border in the end of January or in February, and protected. A larger sowing should be made in March, two more in April, and one in May. Two or three varieties should be employed, for it often happens that one sort succeeds whilst another fails. In northern and cold districts the principal autumn and winter crops should be sown in the last week of June, and in southern parts of the kingdom in the first fortnight of July. A small sowing may be made in the first or second week of August, and even in the last week of that month, for supplying young Turnips occasionally in winter, and for standing later in spring than the main crop. In most situations a sowing once a month, from March to July inclusive, will be sufficient, especially if, from experience, the most suitable varieties can be chosen.

After sowing, the first attention should be directed to the protection of the plants from the ravages of the fly. In some states of the weather this is very difficult, and the whole sowing may either be destroyed, or the plants be so crippled that they never recover. Just before the plants

make their appearance, the ground should be well moistened if the weather is dry, and dusted over with lime. For remedies see p. 96.

A moist season, or one in which warm, cloudy weather prevails, is most suitable for Turnips. In continued dry weather the growth of the plants is checked, and although genial weather should ensue, roots are never so tender and succulent as if growth had taken place at a uniform rate. Watering should therefore be attended to in dry weather. Cold spring water must not, however, be used, as such would tend to check the growth, in hot weather more especially. The soil, by means of moistening and stirring, should be kept as loose as possible, and, as a matter of course, free of weeds. Partial thinning should be commenced as soon as the plants are fairly above-ground, or at all events as soon as they have acquired their first rough leaves. The distance left between the plants must be regulated according to the size of the variety. In rows or drills the small sorts may be left at 4 inches apart, and the larger at 5 or 6 inches. In broadcast sowings 6 inches may be allowed each way for summer crops, and 8 inches for those intended to stand the winter.

Storing the Roots.—Turnips for summer and autumn use are, of course, drawn as they are required—the largest roots being taken first. With respect to the winter supply, the greater portion may generally be left in the ground, to be taken up as wanted; but a small quantity should be taken up, topped, tailed, but not very closely, and stored in sand for use in frosty weather. In cold situations, if the more tender sorts are grown, it is advisable to take up the whole crop, and store it in ridges like Potatoes, and the same precautions taken against frost and damp.

Forcing.—Hard forcing invariably ends in failure; but if early Turnips are particularly required they can be had in May with the aid of a very mild hot-bed and frame. If the latter is somewhat deep, or such as are used for Potatoes, partially fill with short manure, making it quite solid, and on this place 6 inches of good loamy soil. Sow seed of Early Milan thinly broadcast, and cover with fine soil. As soon as the seedlings are up, commence ventilating, giving air rather freely on mild-days, and in small quantities when it is cold, closing some-

what early and covering with mats every night. Thin out lightly at first, leaving the plants about 4 inches apart each way, and then if the more forward are drawn for use when the roots are about 2 inches in diameter, the rest will, if properly attended to, give a good succession. Turnips may also be forwarded considerably

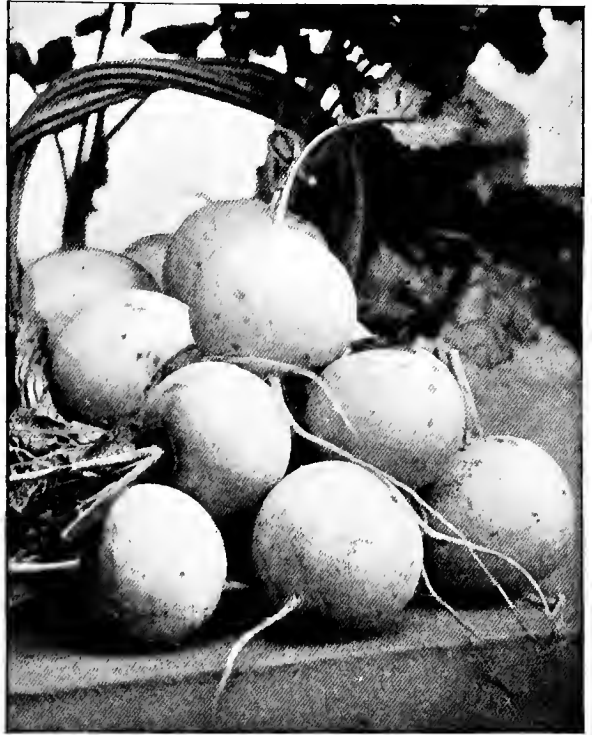


Fig. 1289.—Turnip—Early Snowball.

without bottom heat in shallow frames on a warm border.

To Save Seeds.—It is rather a difficult matter to obtain the seeds of Turnips true in gardens, on account of the tendency which all plants of the Brassica tribe have to cross with one another. For this reason no other plant of that genus should be allowed to flower at the same time in the neighbourhood of the sort the seed of which is to be saved. Only the best-formed plants ought to be selected for bearing seeds, and they should be taken up in autumn, and planted 2 feet apart in an open situation. When the seeds are perfectly ripe, they may be beaten out, and after having been well dried, hung up in a canvas bag in a cool, dry airy place. They retain their germinative power for four or five years, and sometimes longer.

Turnips are liable to be attacked by *anbury*, or *fingers-and-toes* (fig. 1291), in which the roots

become forked or fingered, and ultimately rot. For particulars see under Cabbage, p. 417.

The principal garden varieties are:—

Chirk Castle Black Stone.—A strap-leaved sort with ball-like black-skinned roots, the flesh white and tender, mild in flavour. Useful in winter.

Criterion.—A distinct type of garden Turnip, especially suited for early use, and also as a general crop. It is a strap-leaved variety, having a red top; flesh pure and white, sweet and mild in flavour.

Early Six-weeks.—Globular, and growing chiefly above-ground. Skin greenish-white; flesh white, tender, and of good flavour. Very early, and only adapted for use in a young state in summer and autumn.

Early Snowball (fig. 1289).—The earliest and most perfectly formed round white Turnip for garden use. Flesh snowy-white, solid, and mild in flavour. Unequalled for the exhibition table.

Early White Dutch (fig. 1290).—Roundish-oblately flattened, skin white; flesh white and very tender; must be used in a young state. From 2 to 2½ inches in diameter is a good size for use.

Extra Early Milan.—A remarkably early strap-leaved variety, remaining a long time fit for use. The roots are white, with purple top, round, flattened, and solid, with a very slender tap-root; flesh pure white, sweet, crisp, and of excellent quality. There is also a pure white-skinned form of it.

Matchless.—A valuable companion to *Criterion*, resembling that variety in shape, but with a green instead of a red top. A great acquisition to the list of garden Turnips. The roots go such a depth in the soil that it can stand the dry weather.

Orange Jelly (Golden Ball).—Of a handsome round form, with a small top. The skin is pale-orange, the flesh yellow, juicy, sweet, and tender. It has very little fibre, so that when boiled it almost acquires the consistence of a jelly.

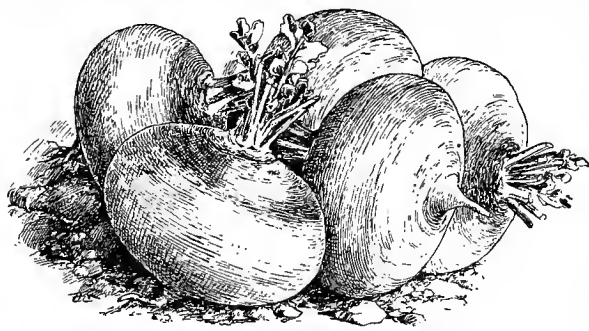


Fig. 1290.—Turnip—Early White Dutch.

Red American Stone.—Small, oblate, growing chiefly above-ground. Skin violet where exposed to the light, white elsewhere; flesh white and tender, but not so sweet as that of many other sorts.

Red Globe (Veitch).—Appreciated for its form, colour, and flavour. Roots globular, and the colour of the top shows to advantage on the exhibition stage. Flesh white and of the finest quality. Does well on heavy soils.

Scarlet Perfection.—For its fine colour, striking form, and high quality this Turnip deserves to be widely grown. In shape it is a counterpart of *Yellow Perfection*, but the skin is of a crimson-scarlet colour, and on the exhibition table it presents a most attractive appearance. Flesh white, close; flavour sweet.

Scotch Yellow.—Roundish, growing about half above-ground. Skin yellow; flesh yellow, firm, and very sweet. An exceedingly hardy sort, standing a severe winter better than any other garden variety. In the south it should be

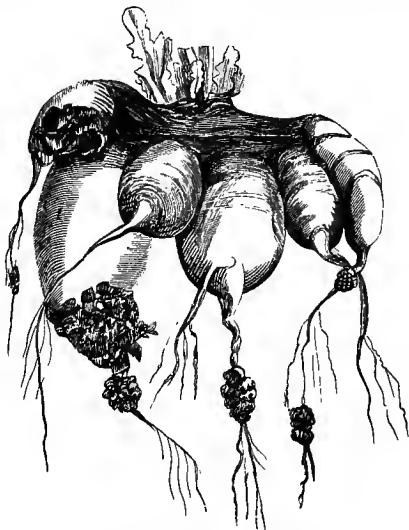


Fig. 1291.—Fingers-and-toes Disease in Turnips.

sown for winter use about the middle of July, and in the north in the beginning of that month.

Teltow (fig. 1292).—Very small, with a tapering root, and a top not larger than that of a Radish. The flesh is firm, very hot, but the rind is more especially so; this part, however, is not peeled off, as in it the piquant flavour is principally contained. It is employed in ragouts, and for seasoning in various ways. It should be sown in light sandy soil. In the neighbourhood of Teltow, in Brandenburg, it is sown in April, and again in August; but for the second sowing in this country July is late enough.

White Gem.—Good for forcing or for the early border. It is oblong in shape, remarkably quick in growth, and of delicious flavour. It forces with greater success, and is also valuable for sowing on an early border in the open for first supplies.

White Stone.—Round, somewhat flattened, larger than *Early White Dutch*. Skin white, tinged with green; flesh white, of fine quality. It is well adapted for late sowings, and is soon fit for use; sown in spring it is apt to run quickly to seed.

Yellow Finland (fig. 1293).—Small, round above, concave below, with a very small tap-root. Top small. Skin smooth and yellow; flesh yellow and very sweet. An excellent sort, somewhat earlier than the *Yellow Malta*, to which it bears considerable resemblance. It should be sown in June and July.

Yellow Malta.—About 2 inches in diameter, round, flattened above, and rather concave below, with a small tap-root proceeding from the centre of the hollow. Flesh yellow and tender. An excellent sort.

Yellow Perfection.—Delicious in flavour, shape rather flat, with short top; colour golden-yellow; certainly one of the handsomest. Matures quickly.

Vegetable Marrow (*Cucurbito Pepo*) (fig. 1294).—The true Vegetable Marrow has long

slender trailing stems, wavy, toothed leaves, sometimes blotched with gray and rough to the touch; the fruits vary in size and shape, but the ordinary size is about 9 inches in length and of

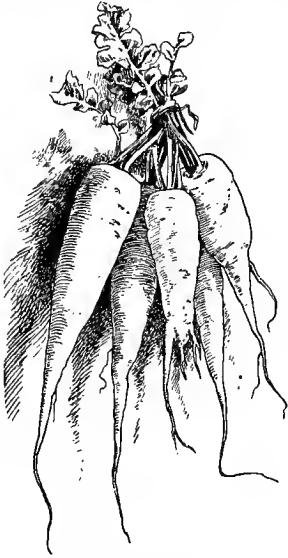


Fig. 1292.—Turnip—Teltow.

the shape shown in the figure. They are most palatable when cooked before they have attained full size. Indeed, it is only when the fruits are in this state that the term "Vegetable Marrow" may be said to be quite appropriate. Not only are the small fruits the most delicately flavoured but their close removal serves to keep the plants in a vigorous productive state, whereas when most of the fruits that form early in the season are allowed to attain a great size, and partially mature seeds, this so exhausts the plants as to prevent them from cropping continuously. During a hot and dry summer Vegetable Marrows are among the few green vegetables available for the London and other markets in quantity, and in this case moderately large fruit pay best.

Culture.—Their cultural requirements are of the simplest description. It is quite a mistake to imagine that a great heap of decaying manure is absolutely necessary for them. On the contrary, they can be successfully grown without any more manure than has been dug into the ground for early Potatoes, and they may be either planted among early maturing short-topped varieties of the latter, or, in the southern counties, be even sown among them from the middle to the end of May, with every prospect of their doing well. Single plants from pots on small hillocks 4 feet apart each way, distributed through the Potato patch, and allowed

to spread and crop as they will, give excellent results.

The market-grower's plan ought to commend itself to private gardeners. It is as follows:—Mark out trenches, in a sunny spot, 4 feet wide with 4 feet intervals; throw out the best of the top spit, and wheel in from 12 inches to 18 inches of warm or only half-decayed manure. Make this firm, and bank over with the soil thrown out, a depth of 9 inches being required. Sow the seeds late in April; and place in gentle heat with a view to having plants ready for the beds from the middle to the end of May, according to whether protection can be afforded or not. If it is not possible to raise the requisite number of plants under glass, sow the seeds in the beds where plants are wanted, the third or last week in May being early enough to do this. The plants may be put out at a distance of 3 feet apart through the centre of the bed, after all danger from frosts is thought past. If hand-lights or bell-glasses can be afforded, for giving the plants a good start, by all means use them, gradually withdrawing them when the plants need more room. A variety of other substitutes, including old baskets, market-sieves, benders, and oiled paper, or even branches of evergreens, are better than no protection at all. In dry weather give water occasionally, but after



Fig. 1293.—Turnip—Yellow Finland.

they are well established it is not often water is afforded. Where the wind is liable to twist the trailing stems about, peg down the leading growths with strong wooden pegs, but there will be little if anything gained by stopping any of the growths. Plants grown under

these conditions will continue bearing freely till severe frosts intervene, and it frequently pays to roughly protect from the earliest of these.

collected, thrown in a heap to heat, and be then turned and framed out in a square heap, 30 inches to 3 feet deep. On this shallow frames or hand-lights may be set, and hillocks of loamy soil placed in them. All this may be done sufficiently early to admit of plants being put out early in May. In addition to covering with glazed lights, mats or other protection should be afforded every night. Do not stop till the main growths are near the outsides of the frames, and the side shoots from these will give early fruit. Early in June commence blocking up the frames with a view to hardening off and allowing the plants to spread of their own free-will. In this manner early as well as continuous crops can be had, and a fine heap of manure be available for the garden during the following winter.



Fig. 1294.—Vegetable Marrow.

Vegetable Marrows are suitable for training over summer arbours, wall-trellises, fences, and such like. In these instances narrow trenches should be opened and otherwise prepared, as advised for the beds in the open.

Forcing and Fruiting on Beds.—Vegetable Marrows may be grown on a hot-bed in a heated brick pit after the manner of Cucumbers, or in houses, as Melons are grown, less heat, however, being desirable. They also succeed in pots of the larger sizes and in boxes. In any case a rich loamy compost, in a coarse state, is desirable, and abundance of water and liquid manure must also be supplied. A temperature ranging from 55° to 60° by night with from 5° to 10° increase in the daytime is quite high enough, and the syringe should be freely used in the mornings of clear days and again on closing the house. Do not stop the plants, but remove side shoots till the roof trellis is reached, afterwards extending the leader straight up the roof and secure as many fruit as possible from the side shoots. It is of the greatest importance that every female flower be fertilized, or otherwise the embryo fruit at the base will turn yellow and drop off. The flowers only remain open a few hours, and it is frequently necessary to fertilize them before 6 a.m.

A few plants could be forwarded in frames and hand-lights set on large beds formed with anything that will generate heat. A mass of stable manure, vegetable refuse, leaves, road trimmings, sweepings, and such like should be

Wood Sorrel (*Oxalis Acetosella*).—A hardy perennial, native of Britain, where it grows wild



Fig. 1295.—Wormwood (*Artemisia Absinthium*).

in woods. The leaves are occasionally used in salads, to which they are by many considered to be a grateful addition. In common with other plants of the same natural order, they contain

a considerable amount of oxalic acid. This plant is seldom cultivated in gardens; but if required, a few plants may be transplanted in spring from the places where they naturally grow, into a moist shady border, the soil of which should be mixed with leaf-mould. By cutting over the plants in April or May, before they come into flower, a fresh growth of young leaves will be induced, and the trouble arising from seed being shed will be prevented.

Wormwood (*Artemisia*) (fig. 1295).—Three species are cultivated:—Common (*A. Absinthium*), Roman (*A. pontica*), Sea Wormwood (*A. maritima*).

These are all hardy perennials, natives of Europe, and are aromatic and intensely bitter.

An infusion of the leaves and tops is used as a vermifuge, tonic, and stomachic; and the leaves are found to be beneficial to poultry. The second sort, not being so nauseous as the others, is the one generally preferred.

Wormwood grows well in any soil, but is most aromatic when planted in a poor and rather dry soil, with a warm aspect. The common sort may easily be raised from seed sown in spring, but both this and the other kinds are generally propagated by dividing the plants in spring, or by cuttings. They may be planted 1 foot apart in rows 15 inches asunder, and will stand for many years in the same place, no other culture being required than to hoe the ground occasionally. Some shoots may be cut when coming into flower, and dried for winter use.

NAMES OF CULINARY VEGETABLES IN ENGLISH, FRENCH, AND GERMAN

A list of the French and German names of culinary vegetables may prove useful to gardeners and others. For the sake of easy reference, the English, French, and German names are arranged in alphabetical order in the following tables. In each case the most popular name in each language is given, although many of the plants have several such names. The list has been corrected with the aid of *Les Plantes Potagers*, by M. Henri Vilmorin:—

ENGLISH		FRENCH		GERMAN
Alexanders	...	Maceron	...	Smyrnerkraut
Angelica	...	Angélique	...	Angelika
Anise	...	Anis, Boucage	...	Anis
Artichoke	...	Artichaut	...	Artischocke
Asparagus	...	Asperge	...	Spargel
Balm	...	Mélisse, Citronelle	...	Citronenmelisse
Basil	...	Basilic grand	...	Basilikum
Bean, Broad	...	Fève	...	Garten-bohnen
Beet, Leaf	...	Bette, Poirée (White)	...	Beete, Mangoldkraut
Beet-root	...	Betterave	...	Runkel-Rübe
Borage	...	Bourrache	...	Borretsch
Borecole	...	Chou vert	...	Grünkohl, Braunkohl
Broccoli	...	Choux Brocolis	...	Broccoli, Spargelkohl
Brussels Sprouts	...	Chou de Bruxelles or à jets	...	Sprossenkohl, Brüsseler Kohl
Burnet	...	Pimprenelle	...	Pimpernelle
Cabbage	...	Chou cultivé	...	Kohl, Kraut
Capsicum	...	Piment	...	Guinea-pfeffer
Caraway	...	Carvi	...	Kümmel
Cardoon	...	Cardon	...	Kardon
Carrot	...	Carotte	...	Möhre, Gelbrübe
Cauliflower	...	Chou-fleur	...	Blumenkohl
Celeriac	...	Céli-rave	...	Knoll Sellerie
Celery	...	Célieri	...	Sellerie
Chamomile	...	Camomille	...	Kamille
Chervil	...	Cerfeuil	...	Kerbel, Körbel
Chicory	...	Chicorée sauvage	...	Cichorie
Chive	...	Ciboulette, Civette	...	Schnittlauch
Clary	...	Sauge Sclarée	...	Scharlachkraut
Coriander	...	Coriandre	...	Coriander
Corn Salad	...	Mâche	...	Ackersalat
Costmary	...	Baume-cog	...	Frauenmünze
Cress, American	...	Cresson d'Amérique	...	Amerikanische Kresse
Cress, Common	...	Cresson alénois	...	Gartenkresse
Cress, Water	...	Cresson de fontaine	...	Brunnenkresse
Cucumber	...	Concombre	...	Gurke
Dandelion	...	Dent de lion, Pissenlit	...	Löwenzahn
Dill	...	Aneth	...	Dill
Egg Plant	...	Aubergine	...	Eierpflanze
Elecampane	...	Aulnée	...	Alant
Endive	...	Chicorée Endive	...	Endivien, Endivie
Fennel	...	Fenouil	...	Fenchel
Garlic	...	Ail ordinaire	...	Knoblauch
Good King Henry	...	Anserine Bon-Henri	...	Gemeiner-Gänsefuss
Gourd	...	Courge, Potiron	...	Speise-Kürbiss
Hop	...	Houblon	...	Hopfen
Horehound	...	Marrube blanc	...	Andorn
Horse-Radish	...	Raifort sauvage	...	Meerrettig
Hyssop	...	Hyssope	...	Isop
Indian Corn	...	Mais sucré	...	Mais
Jerusalem Artichoke	...	Topinambour	...	Erdapfel

ENGLISH		FRENCH		GERMAN
Kidney-Bean ... ..	...	Haricot ... ..	...	Schminkbohne, Phaseole
Kohl Rabi ... ..	...	Choux-navets ... ..	...	Kohl-Rübe
Lavender ... ..	...	Lavande ... ..	...	Lavendel
Leek ... ..	...	Poireau ... ..	...	Lauch
Lentil ... ..	...	Lentille ... ..	...	Linse
Lettuce ... ..	...	Laitue cultivée ... ..	...	Lattich
Liquorice ... ..	...	Réglisse ... ..	...	Süßholz
Marigold ... ..	...	Souci des jardins ... ..	...	Ringelblume
Marjoram ... ..	...	Marjolaine vivace ... ..	...	Englischer Majoran
Mint ... ..	...	Menthe ... ..	...	Münze, Minze
Mint, Pennyroyal ... ..	...	Pouliot ... ..	...	Poleimünze
Mint, Pepper ... ..	...	Menthe poivrée ... ..	...	Pfeffermünze
Morel ... ..	...	Morille ... ..	...	Morchel
Mushroom ... ..	...	Champignon ... ..	...	Schwamm
Mustard ... ..	...	Moutarde blanche ... ..	...	Gelber Senf
Nasturtium ... ..	...	Capucine ... ..	...	Indianische Kresse
Nasturtium, tuberosus ... ..	...	Capucine tubereuse ... ..	...	Peruanische Knollen Kresse
New Zealand Spinach ... ..	...	Tétragone cornue ... ..	...	Neuseeländischer Spinat
Oca ... ..	...	Oxalis crénelée ... ..	...
Onion ... ..	...	Oignon ... ..	...	Zwiebel, Zipolle
Orach ... ..	...	Arroche ... ..	...	Gartenmelde
Parsley ... ..	...	Persil ... ..	...	Petersilie
Parsnip ... ..	...	Panais ... ..	...	Pastinake
Pea ... ..	...	Pois ... ..	...	Erbse
Pennyroyal ... ..	...	Pouliot ... ..	...	Poleimünze
Potato ... ..	...	Pomme de terre... ..	...	Kartoffel
Purslane ... ..	...	Pourpier ... ..	...	Portulak
Quinoa ... ..	...	Ansérine Quinoa blanc... ..	...	Peruanischer Reis-Spinat
Radish ... ..	...	Radis ... ..	...	Radies
Rampion ... ..	...	Raiponce ... ..	...	Rapunzel-Rübe
Rape ... ..	...	Navette ... ..	...	Raps, Reps, Kohlraps
Rhubarb ... ..	...	Rhubarbe ... ..	...	Rhabarber
Rocambole ... ..	...	Ail Rocambole ... ..	...	Roccambol
Rosemary ... ..	...	Romarin ... ..	...	Rosmarin
Rue ... ..	...	Rue ... ..	...	Raute
Sage ... ..	...	Sauge officinale ... ..	...	Salbei
Salsafy ... ..	...	Salsifis ... ..	...	Haferwurz
Samphire ... ..	...	Perce-pierre ... ..	...	Meerfenchel
Savory ... ..	...	Sarriette ... ..	...	Bohnenkraut
Savoy ... ..	...	Chou de Milan ... ..	...	Savoyerkohlr
Scarlet-Runner ... ..	...	Haricots d'Espagne ... ..	...	Arabische Bohne
Scorzonera ... ..	...	Scorsonère ... ..	...	Scorzoner
Scurvy Grass ... ..	...	Cochléaria, Herbe aux cuillers... ..	...	Löffelkraut
Sea-Kale ... ..	...	Crambé ... ..	...	Seekohl
Shallot ... ..	...	Échalote ... ..	...	Schalotte
Skirret ... ..	...	Chervis ... ..	...	Zuckerwurz
Sorrel ... ..	...	Oseille ... ..	...	Sauerampfer
Spinach ... ..	...	Épinard ... ..	...	Spinat
Tansy ... ..	...	Tanaisie ... ..	...	Rainfarn
Tarragon ... ..	...	Estragon ... ..	...	Dragon
Thyme ... ..	...	Thym ... ..	...	Thymian
Tomato ... ..	...	Tomate ... ..	...	Tomate
Tree Primrose ... ..	...	Éuothère bisannuelle ... ..	...	Rapunica
Truffle ... ..	...	Truffe ... ..	...	Trüffel
Turnip ... ..	...	Navet ... ..	...	Herbst-Rübe
Vegetable Marrow ... ..	...	Courge à la Moelle ... ..	...
Wood Sorrel ... ..	...	Alléluia, Surelle, Surette, Petite Oseille ... ..	...	Sauerklee
Wormwood ... ..	...	Absinthe... ..	...	Wernuth

GERMAN-ENGLISH LIST

GERMAN	ENGLISH	GERMAN	ENGLISH
Ackersalat	Corn Salad	Lauch	Leek
Alant	Elecampane	Lavendel	Lavender
Amerikanische Kresse ...	American Cress	Linse	Lentil
Andorn	Horehound	Löffelkraut	Scurvy-Grass
Angelika	Angelica	Löwenzahn	Dandelion
Anis	Anise	Maïs	Indian Corn
Arabische Bohne	Scarlet Runner	Mangoldkraut	Leaf-Beet
Artischocke	Artichoke	Meerfenchel	Samphire
Basilikum	Basil	Meerrettig	Horse-Radish
Beete	Leaf-Beet	Minze	Mint
Blumenkohl	Cauliflower	Möhre	Carrot
Bohnenkraut	Savory	Morchel	Morel
Borretsch	Borage	Münze	Mint
Braunkohl	Borecole	Neuseeländischer Spinat	New Zealand Spinach
Broccoli	Broccoli	Pastinake	Parsnip
Brunnenkresse	Water Cress	Peruanische Knollen Kresse	Tuberous Nasturtium
Brüsseler Kohl	Brussels Sprouts	Peruanischer Reis-Spinat	Quinoa
Cichorie	Chicory	Petersilie	Parsley
Citronenmelisse	Balm	Pfeffermünze	Peppermint
Coriander	Coriander	Phaseole	Kidney-Bean
Dill	Dill	Pimpernelle	Burnet
Dragon	Tarragon	Poleimünze	Pennyroyal Mint
Eierpflanze	Egg-plant	Portulak	Purslane
Endivie, Endivien	Endive	Radies	Radish
Englischer Majoran	Marjoram	Rainfarn	Tansy
Erbse	Pea	Raps	Rape
Erdapfel	Jerusalem Artichoke	Rapuntica	Tree Primrose
Fenchel	Fennel	Rapunzel-Rübe	Rampion
Fisole	Kidney-Bean	Raute	Rue
Frauenmünze	Costmary	Reps	Rape
Garten-Bohnen	Broad Bean	Rhabarber	Rhubarb
Gartenkresse	Common Cress	Ringelblume	Marigold
Gartenmelde	Orach	Roccambol	Rocambole
Gelber Senf	Mustard	Rosmarin	Rosemary
Gelbrübe	Carrot	Runkel-Rübe	Red Beet
Gemeiner-Gänsefuss	Good King Henry	Salbei	Sage
Grünkohl	Borecole	Sauerampfer	Sorrel
Guinea-pfeffer	Capsicum	Sauerklee	Wood Sorrel
Gurke	Cucumber	Savoyerkohl	Savoy
Haferwurzel	Salsafy	Schalotte	Shallot
Herbst-Rübe	Turnip	Scharlachkraut	Clary
Hopfen	Hop	Schminkbohne	Kidney-Bean
Indianische Kresse	Nasturtium	Schnittlauch	Chive
Isop	Hyssop	Schwamm	Mushroom
Kamille	Chamomile	Scorzoner	Scorzoneria
Kardon	Cardoon	Seekohl	Sea-Kale
Kartoffel	Potato	Sellerie	Celery
Kerbel	Chervil	Senf	Mustard
Knoblauch	Garlic	Smyrnerkraut	Alexanders
Knoll Sellerie	Celeriac	Spargel	Asparagus
Kohl	Cabbage	Spargelkohl	Broccoli
Kohlraps	Rape	Speise-Kürbiss	Gourd
Kohl-Rübe	Kohl Rabi	Spinat	Spinach
Körbel	Chervil	Sprossenkohl	Brussels Sprouts
Kraut	Cabbage	Süßholz	Liquorice
Kümmel	Caraway	Thymian	Thyme
Lattich	Lettuce	Tomate	Tomato
		Trüffel	Truffle
		Wermuth	Wormwood
		Zipolle	Onion
		Zuckerwurzel	Skirret
		Zwiebel	Onion

FRENCH-ENGLISH LIST

FRENCH	ENGLISH	FRENCH	ENGLISH
Absinthe	Wormwood	Haricot	Kidney-Bean
Ail ordinaire	Garlic	Haricots d'Espagne	Scarlet Runner
Ail Rocambole	Rocambole	Herbe aux cuillers	Scurvy-Grass
Alléluia	Wood Sorrel	Houblon	Hop
Aneth	Dill	Hyssope	Hyssop
Angélique	Angelica	Laitue cultivée	Lettuce
Anis	Anise	Lavande	Lavender
Anserine Bon-Henri	Good King Henry	Lentille	Lentil
Anserine Quinoa blanc	Quinoa	Macaron	Alexanders
Arroche	Orach	Mâche	Corn Salad
Artichaut	Artichoke	Mais sucré	Indian Corn
Asperge	Asparagus	Marjolaine vivace	Marjoram
Aubergine	Egg-plant	Marrube blanc	Horehound
Aulnée	Elecampane	Méliste	Balm
Basilic grand	Basil	Menthe	Mint
Baume-coq	Costmary	Menthe poivrée	Peppermint
Bette	Leaf-Beet	Morille ¹	Morel
Betterave	Beet-root	Moutarde blanche	Mustard
Boucage	Anise	Navet	Turnip
Bourrache	Borage	Navette	Rape
Camomille	Chamomile	Oignon	Onion
Capucine	Nasturtium	Oseille	Sorrel
Capucine tubereuse	Tuberous Nasturtium	Oxalis-crênelée	Oca
Cardon	Cardoon	Panais	Parsnip
Carotte	Carrot	Perce-pierre	Samphire
Carvi	Caraway	Persil	Parsley
Céleri	Celery	Petite Oseille	Wood Sorrel
Céleri-rave	Celeriac	Piment	Capsicum
Cerfeuil	Chervil	Pimprenelle	Burnet
Champignon	Mushroom	Pissenlit	Dandelion
Chervis	Skirret	Poireau	Leek
Chicorée Endive	Endive	Poirée	Leaf-Beet
Chicorée sauvage	Chicory	Pois	Pea
Chou cultivé	Cabbage	Pomme de terre	Potato
Chou de Bruxelles or à jets	Brussels Sprouts	Potiron	Gourd
Chou de Milan	Savoy	Pouliot	Pennyroyal Mint
Chou-fleur	Cauliflower	Pourpier	Purslane
Chou vert	Borecole	Radis	Radish
Choux Brocolis	Broccoli	Raifort sauvage	Horse-Radish
Choux-navets	Kohl Rabi	Raiponce	Rampion
Ciboulette	Chive	Réglisse	Liquorice
Citronelle	Balm	Rhubarbe	Rhubarb
Civette	Chive	Romarin	Rosemary
Cochléaria	Scurvy-Grass	Rue	Rue
Concombre	Cucumber	Salsifis	Salsafy
Coriandre	Coriander	Sarriette	Savory
Courge	Gourd	Sauge officinale	Sage
Courge à la Moelle	Vegetable Marrow	Sauge Sclarée	Clary
Crambé	Sea-Kale	Scorsonère	Scorzonera
Cresson alénois	Common Cress	Souci des jardins	Marigold
Cresson d'Amérique	American Cress	Surelle	Wood Sorrel
Cresson de fontaine	Water Cress	Surette	Wood Sorrel
Dent de lion	Dandelion	Tanaisie	Tansy
Échalote	Shallot	Tétragone cornue	New Zealand Spinach
Énothère bisannuelle	Tree Primrose	Thym	Thyme
Épinard	Spinach	Tomate	Tomato
Estragon	Tarragon	Topinambour	Jerusalem Artichoke
Fenouil	Fennel	Truffe	Truffle
Fève	Broad Bean		

¹ This must not be confounded, as it sometimes is, with the *Morelle*, which is the French name of *Solanum nigrum*, a plant which, if not poisonous, belongs to a very suspicious family.

CALENDAR OF OPERATIONS IN THE FRUIT AND KITCHEN GARDENS.

Although calendrical directions for garden operations cannot be strictly followed in all cases, differences in climate, soil, and other conditions often rendering deviation expedient or absolutely necessary, yet it will be found that in the following Calendar most of the circumstances that lead to exceptions have been noticed, and suitable directions given. It would be almost impossible to provide for every contingency; but any intelligent person will easily adopt such modifications as his particular case may require. It is presumed that the directions here given will be generally applicable throughout the United Kingdom. Within certain limits of elevation the difference between the temperatures of any two places is much less than frequently occurs between the temperature of the same season in two different years at the same place. For example, if we take March—the principal spring month for seed-sowing—we find that over nearly ten degrees of latitude, extending from Paris to Wick, in Caithness, the mean temperature of that month differs very little on the average of a number of years, as will be seen by the following table:—

	Latitude.	Mean Temperature of March.
Paris.....	48° 50'	43° 79
Rouen	49 26	41 12
Brussels	50 51	42° 78
Chiswick (London)	51 29	42° 23
Boston (Lincolnshire)	52 48	41° 67
Dublin.....	53 21	42° 46
Liverpool.....	53 25	44° 44
Edinburgh	55 58	40° 53
Dundee.....	56 27	42° 20
Aberdeen.....	57 9	42° 80
Elgin.....	57 38	40° 53
Wick	58 29	41° 94

From the above it appears that the mean temperature of March is nearly the same at London, Dublin, Dundee, and Aberdeen, although the last-named of these places is nearly 400 miles north of the first. At Elgin the month of March is just as warm as it is at Edinburgh, and at Wick the mean temperature at that period of the year is higher than at Edinburgh. It will

also be seen that at all the above places the difference of temperature in March is not such as to materially affect the CALENDAR OF OPERATIONS. In fact its scope may include all those widely-distant places.

But in the same month in different years at the same place, a considerable variation frequently occurs, in consequence of which modifications of usually applicable directions have to be made. The mean temperature of the month to which we have referred varies as much as ten degrees in different years; and operations such as sowing and planting, which in ordinary seasons would be proper for the first week of March, may not be practicable, in consequence of frost and snow, till the very end of the month.

The adaptation of a Calendar, therefore, is more affected by the variations of the seasons than by any circumstance connected with localities fit for gardens throughout the extent of the British Islands.

JANUARY.

KITCHEN-GARDEN DEPARTMENT.

If the weather prove frosty, wheel manure to quarters where it will be required, taking care, however, to put it together in a compact heap if it cannot be immediately used. Deep cultivation is very essential to produce excellent vegetables. Trenching should be carried on, leaving the soil on the surface rough to be pulverized by the weather, but on no account should masses of frozen soil be buried, as they are long in thawing; and whilst this is taking place, and for a considerable time afterwards, the soil is kept in a cold saturated condition, which renders it very unfavourable to vegetation. Clear off all vegetables that may have been killed by frost. When the state of the soil will permit, stir the surface between crops of Cabbage, Lettuce, winter

Onions, Spinach, &c. Small three-pronged drags are useful for this purpose.

Artichokes.—Remove decaying leaves and cut the stems off near the ground. Give additional protection if the weather is severe, so as to prevent the ground from freezing about the roots. Some dry leaves or litter should be put over the hearts of the plants, but must be removed when the frost is past.

Asparagus beds should have a top-dressing of well-decomposed manure if they have not already been attended to in this respect. Sea-weed, and a mixture of cow and horse dung, may be employed. This mulching will in due time prove to be highly beneficial.

Beans.—Sow, in a warm situation, Early Dwarf Prolific, or Early Long-Pod; and some may be sown in pots or boxes for transplanting. Towards the end of the month make a sowing of Long-Pod and Broad Windsor in rows, 2 to 3 feet apart.

Broccoli.—Take up on a dry day such as are fit or nearly fit for use, and place in a cellar. If the weather is likely to be severe, those which have just commenced to form heads should be taken up with a ball and housed.

Cabbage.—Plant out from the seed-beds some of the largest plants of Ellam's Early. At the end of the month sow seeds of the same kind on a warm border, or in a cold frame. Some seed of Red Cabbage may also be sown at the same time.

Cardoons.—Those which are full-grown may be taken up with balls on a dry day, and planted among sand in a shed or cellar, where they can be protected from frost, taking care to examine them frequently, in order to remove all decaying leaves.

Carrots.—Sow seeds of one or two early sorts on a south border. Examine the roots in store, and remove any that are unsound; take off young growths if any are being made.

Cauliflowers.—Take up and house those fit for use. Sow a few seeds in gentle heat in a frame, to be pricked out in due course. When the state of the weather will permit, give plenty of air to plants under glass, in whatever stage of growth they may be. Put mats or litter over them when the frost is severe.

Celery.—Sow a few seeds in pans, in moderate heat under glass, for early use. Protect plants in ridges with straw or long stable litter. The top of the ridge should be entirely covered about 12 inches thick. Plants that are completely blanched will suffer most from frost; it will therefore be advisable to take up some and

plant them deeply in sand in a cellar or shed, taking care that the leaves are tied up so as not to be broken in the operation. Earth up the latest crop when the weather permits.

Endive.—Tie up, for blanching successively, in dry weather. Protect from frost. A quantity of Winter Curled, and of Batavian, may be taken up from the open ground, and planted in sand or dry sandy soil in any dark place where there is a temperature of between 50° and 55°.

Horse-Radish.—Make new plantations. Dig up and put in sand, for a supply in case of hard frost.

Jerusalem Artichokes.—Some of these may be taken up and housed. Towards the end of the month a new plantation may be made in any spare corner.

Lettuce.—Sow Black-seeded Gottle and Hick's Hardy White Cos, also Stanstead and Early Paris Cabbage kinds. When the leaves are at any time a little frozen, care must be taken to prevent the sun's rays from acting upon them whilst they are in that state. Give plenty of air in favourable weather to the young plants from the autumn sowing, in protecting-frames. If the weather prove favourable towards the end of the month a few of these may be planted out on a sheltered border.

Onions.—Sow summer kinds in a warm border, or in pans in a frame, for transplanting out-of-doors for salads. The Queen is an excellent early kind, and Early White Naples, a larger variety quite as good, sown in August, will now be fit to draw for salads.

Parsley.—Protect a portion from severe frost. A little may be sown in a sheltered situation.

Peas.—Protect early-sown ones from the attacks of birds and slugs. Sow a successional lot of such early sorts as Chelsea Gem, Excelsior, Acme, or Ideal at the end of the month. These are also suitable for sowing in pots to be protected under glass, and afterwards planted out on a warm border. When the soil is tolerably dry, some earth should be drawn to plants a little above-ground; and they should be staked rather closely for shelter, as well as for future support.

Potatoes.—Plant Ash-leaved Kidney or any other good early sort in the driest ground. The sets should be placed 7 inches deep.

Radishes.—Sow under a south wall, or on any sheltered border sloping to the sun, covering with litter at night, and uncovering during the day, when the weather is not severe.

Spinach.—A few rows may be protected in

case of severe frost. Remove decayed leaves. Towards the end of the month a little Summer or Round Spinach may be sown between the rows of Peas.

Turnips.—At the end of the month sow Early Milan, Snowball, or White Stone on a warm border.

HARDY-FRUIT DEPARTMENT.

The ground for plantations of fruit-trees should be prepared in autumn, for these trees are, generally speaking, best planted immediately after the fall of the leaf; but if circumstances have prevented the preparation of the ground, this should be carried on when the weather permits. If the subsoil is good, the ground should be loosened to the depth of 3 feet; if water rise so as to remain for any considerable time within that distance from the surface, means should be adopted for drawing it off; if there should be no possibility of doing this owing to want of fall, then, in trenching, soil, rubbish, or stones may be put to the bottoms of the trenches, in order to raise the good soil to a higher level.

Plant Apples, Pears, Plums, Cherries, Quinces, Medlars, Chestnuts, Walnuts, Mulberries, Filberts, Gooseberries, Currants, Raspberries, Apricots, Peaches, and Nectarines.

Prune all the kinds of trees above-mentioned, but not when their branches are frozen.

Shoots to be used as grafts should be cut off, especially those of Plums, Cherries, and Apples, as, if not taken off early they seldom succeed. Place them with their ends in soil in a sheltered situation, where neither the sun's rays nor drying winds will directly affect them, till the grafting season arrive. Cut back the limbs of old trees intended to be grafted, for if left till the sap is flowing, the bark dies back below the wound, and canker is apt to ensue. Thin out shoots where they are too crowded, and remove all useless growths from the central part of the trees in bearing. Cut off the heads of stocks; those of the Quince should be cut off early in the month.

Make cuttings of Gooseberries and Currants; they may be 9 inches or 1 foot in length, and all the eyes should be picked out to the height of 6 inches from the base.

Clean and fork lightly the ground between the rows of Strawberries; and then mulch with long dung, the nourishing principles of which will be carried down to the roots by the rain for the benefit of the crop; litter the ground with straw to keep the fruit clean.

In bad weather prepare new nails by putting them in boiling linseed-oil, which will prevent them from rusting. Pick the shreds from nails that have been used, heat the nails to a red-heat, and when cooled a little below this, plunge them in the oil. All shreds fit to use again should be boiled to destroy insects.

FORCING DEPARTMENT.

Asparagus.—Make fresh beds for succession. Those in bearing should have a bottom-heat of between 60° and 70°; the top-heat should be about the same, but care should be taken that it does not exceed 75°. For early forcing, pits having hot-water pipes are preferable to others, as they will admit, under any conditions, of giving the shoots plenty of air to green them, and give flavour. The sashes may be drawn up for a short time in very fine days, so that as many of the direct rays may be admitted as may be possible without lowering much the temperature. Add fresh linings when necessary, so as to maintain the proper heat. As bearing plants become exhausted, they may be removed from pits or frames, and replaced by fresh plants, provided sufficient heat can still be kept up by linings or otherwise.

Carrots.—Sow Early Short Horn or Parisian Forcing on a slight hot-bed.

Chicory.—Introduce some previously potted plants to the Mushroom-house, or other warm place where they can be kept dark by means of an inverted pot.

Cress.—Sow successionally in moderate heat.

Egg-plants.—Sow in small pots, and place in a heat of from 65° to 70°.

Endive can be preserved in good condition through the winter by placing it in pits where it can have plenty of air, and where severe frost can be excluded. Imperial Batavian is an excellent kind for winter salads.

Kidney-Beans.—Sow in pots filled with rich soil, and place them in heat till the plants begin to grow; they must then be placed in the light, and should have a temperature of 60° to 70° at night, and 75° or 80° during the daytime. They must be frequently syringed, to keep down red spider.

Lettuce.—Remove decaying leaves, and give air at all times when the state of the weather will permit. A dressing of powdered charcoal, between the plants, will tend greatly to keep the air sweet and prevent rotting.

Mint.—Plant in pots or boxes, and introduce into heat.

Mushrooms.—Collect horse-droppings free from litter, and keep them dry for succession-beds, some of which should now be formed. Maintain in the Mushroom-house a moist atmosphere and a temperature of between 55° and 60°; but that of the beds may range from 60° to 65°.

Mustard and Cress.—Sow successionally in moderate heat.

Peas.—In the beginning of the month sow in pots, and forward in gentle heat where plenty of air can be admitted.

Potatoes.—Plant tubers of an early sort, in small pots, one set in each. The pots may then be piled together in any warm place, either light or dark, till the shoots are about to appear, when the plants should be turned out and planted on a slight hot-bed, 18 inches by 8 inches apart. Some may also be grown to maturity in pots.

Radishes.—Sow on slight hot-beds, in rows, in light, rich soil, which should be near the glass, and the frame well ventilated until growth beyond the cotyledons is developed.

Rhubarb.—By introducing roots of this into the Mushroom-house, constant supplies can be maintained at less cost in labour than if fermenting materials are used.

Sea-Kale.—Continue to force this in succession. The old practice of forcing it by means of pots and fermenting materials in the open ground is almost discontinued, single crowns being prepared for the purpose instead. Take up the plants and place in soil, in the Mushroom-house or elsewhere, so that they may be in heat and kept from the light. The supply thus obtained will be more certain in bad weather than that from plants forced in the open ground.

Tarragon.—Plants in pots should be brought into heat.

Tomatoes.—If some of these are required early, sow seeds at once.

Cucumbers.—A heat of 75° at the roots should be maintained in the pits or houses in which plants are growing, and from 70° to 80°, according to outside influences, in the daytime. Give air when the weather permits, so as to dry the foliage once a day; but let it be given by degrees. If the plants require water, let it be warmed to the temperature of the air.

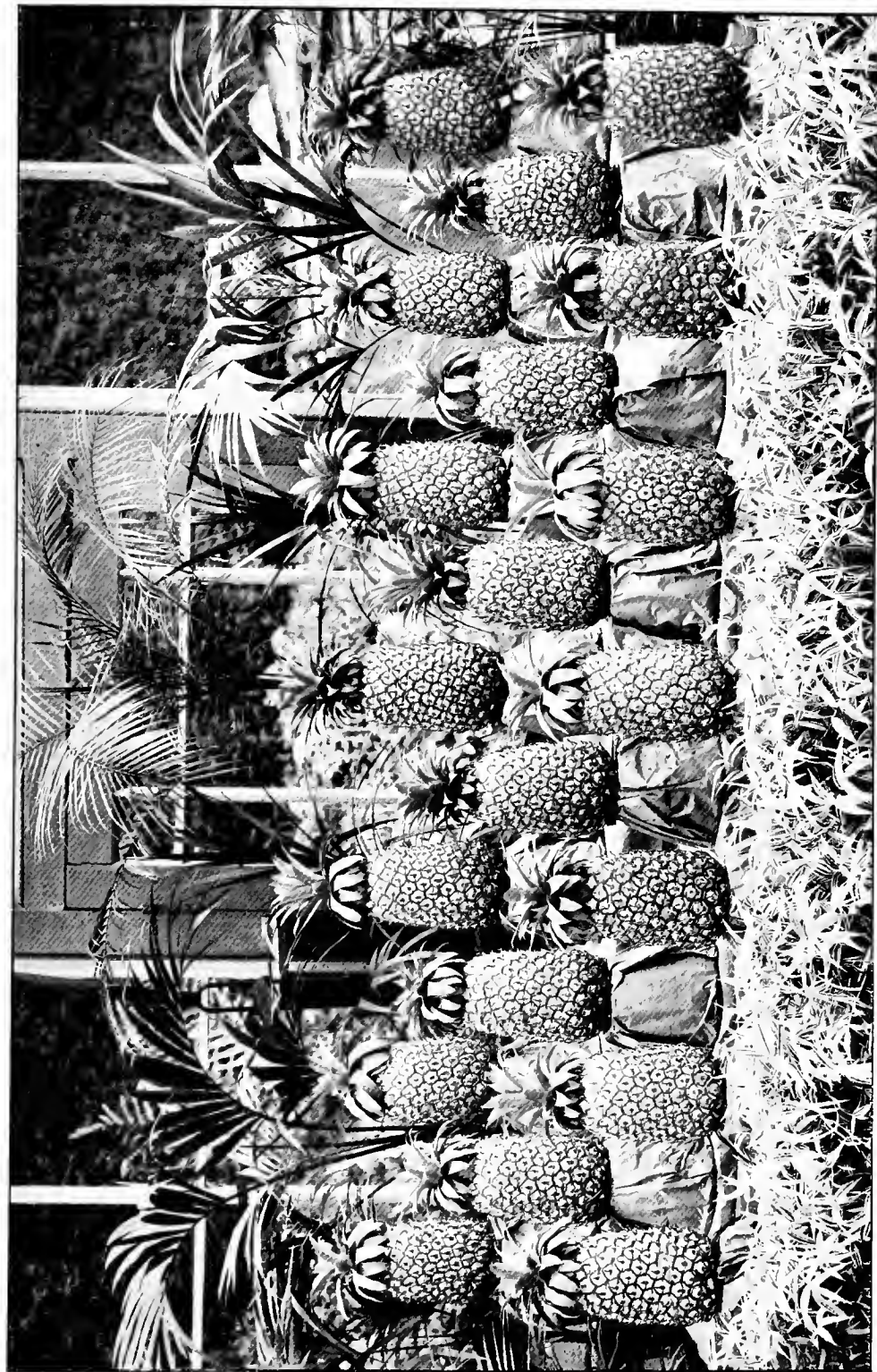
Melons.—Prepare the beds in the house or pit, as the case may be, by placing a layer of half-decomposed leaves at the bottom of the beds on which the hillocks will be made. Sow early sorts in 3-inch pots, and place in a bottom-heat of 75°, and a top-heat of 70°. When the roots have

reached the sides of the pot, plant in a bed where a bottom-heat of 80° and a top-heat of 75° can be afforded. Let the plants have as much sun-light as they can safely bear. Give air. Water in the forenoon, taking care that the heat of the water is equal to that of the air.

Pine-Apples.—The fruiting plants should have a bottom-heat of 80° and a top-heat of 70° at night, and 75° in the day, or with sun-heat 85°. Plants required to start early should have a temperature of 75° at night, and from 80° to 85° in the day, or as high as 95° with sun-heat. Succession plants require a lower temperature. For these the bottom-heat should be 75°, and the top-heat 65° in the day, or 70° if the weather be clear. The soil should always contain moisture for the roots, not merely at the top or by the sides of the pots, but throughout the mass. Cold water should not be used. Give air in such a way as not to cause any sudden fall of temperature.

Vines.—In preparing to force these, let the house be thoroughly cleaned. Clear off the loose bark from the canes, but do not peel them too hard, unless some insect pest infest them. Wash them with soap and water. The walls and pipes should be whitewashed with lime mixed with flowers of sulphur. Commence with a temperature of 50° at night, and 60° in the day, or 70° by sun-heat. Increase the heat gradually to 55° at night, and 65° in the day, when the buds are swelling. If the plants in an earlier house are in leaf, let the temperature be about 60° at night, and from 65° to 75° in the day, or 80° with sun-heat. When showing flower, the temperature should be 60° at night, and 75° in the day, or with sun-heat, 80°. Muscats require a higher temperature for setting, as well as for their future growth. When in flower they should have a temperature of 65° at night, and from 75° to 85° by sunshine. At the time of starting, very strong growths of the former year should be turned back towards the front of the house, in order to induce the buds to push more regularly. Maintain a moist atmosphere in the house, and use tepid water for syringing. Be careful to avoid wetting the pipes when they are very hot, or a crop of rusty Grapes may be the result. Stop the shoots of those so far advanced as to require it. Remove super-abundant bunches, and commence thinning operations early.

Figs.—Commence forcing with a temperature of 50° at night, and 60° by day with sun-heat; gradually increase the temperature in two or



ENGLISH-GROWN PINE-APPLES

three weeks to 60° by night, and 65° by day. Take care that the plants are never dry at the roots, for after being once too dry, the young fruit is apt to turn yellow and drop. But whilst dryness is guarded against, sufficient drainage should have been provided, so that the plants may not suffer from stagnant moisture.

Peaches and Nectarines.—On fine days an abundance of air should be given, cold currents being avoided. As the trees cannot with safety be subjected at first to a high temperature, begin with 50° by night, and 55° or 60° by day, or 60° to 70° with sun-heat. When in flower on fine airy or sunny days the pollen will naturally be dry and in a fit state for impregnating the flowers. This operation should be performed with a camel-hair pencil; syringing on fine days may proceed as usual, but in a more moderate way. Disbud very sparingly, at first removing some of the strongest superfluous shoots from the upper part of the branches. Look out for green-fly, and fumigate on its appearance, or the foliage may be moistened with the syringe, and sprinkled with powdered tobacco or snuff.

Cherries.—Commence to give a little fire-heat, if absolutely necessary, with plenty of air. A temperature of 40° by night, and 50° by day, or 60° by sun-heat, will be sufficient. A free current of air should be allowed through the house, which should not be closed before the temperature falls to 55°.

Strawberries.—Start these in a temperature of 45° at night, and 60° by day. If the pots can have a bottom-heat of from 60° to 65°, it will encourage the formation of an abundance of roots where these are found to be deficient. A shelf near the top ventilators of a Peach or other house having similar conditions is a good place for Strawberries at this advanced season. After the fruit is set, increase the temperature to 55° by night, and 65° by day, or 70° by sun-heat. When sufficient fruits are set, cut off all others that are forming. At this stage of their growth, manure-water may be safely given.

FEBRUARY.

KITCHEN-GARDEN DEPARTMENT.

Continue to manure, dig, or trench all vacant ground when the weather will permit, and take advantage of the first opportunity to prepare the ground intended for sowing the general

crops of Onions, Parsnips, Carrots, &c. On light soils the ground should be trodden firmly for Onions. Protect, if necessary, with litter, spruce branches, &c., such things as require protection. Examine stored roots.

Asparagus.—Dress beds if not already done.

Beans.—A successional sowing should be made about the middle of this month of any of the large and prolific kinds. Those which have been raised in heat may be hardened off in the open air and planted out, protecting them in case of frost.

Brussels Sprouts.—Sow for an early plantation where the plants can be sheltered in case of severe weather.

Cabbage.—At the beginning of the month make a small sowing of Ellam's Early, or other early kinds, on a warm border. If required early, some seed of a quick-hearting Red Cabbage may be sown at the same time out-of-doors. Plant out from the autumn sowing; these plants will form a succession to the general crop.

Carrots.—Make a small sowing of the Early Horn in the first week, if the weather has been unfavourable in the previous month, and sow for the general crop any time after the middle of the month.

Cauliflower.—Sow some of the Walcheren and Early London on a warm border to make a successional crop after those planted out-of-doors from frames.

Celery may be sown in a moderate heat at the beginning of the month for a very early crop, and the first principal sowing may be made at the end of the month in gentle heat.

Garlic.—Plant in drills. Set the cloves 2 or 3 inches deep, and 6 inches apart.

Horse-Radish.—Plant in ground well trenched and manured.

Hyssop.—Sow seeds in a pan for transplanting.

Leeks.—If required early, sow in the middle or end of the month in a pan or box in a moderate heat for transplanting.

Lettuce.—Sow White Paris Cos and Neapolitan Cabbage sorts. Plant out some of those sown in frames, if the weather be favourable.

Mustard.—Make successional sowings in heat.

Onions.—If the weather is favourable, and the ground in good condition, sow the main crop as early in the month as possible. Spanish kinds, if sown in September for transplanting to produce large bulbs, may now be planted in rows 9 inches apart and 18 inches from each other.

Parsley.—Sow to succeed the late sowings of the previous year.

Peas.—About the middle of the month, make a sowing of the best kinds, and stake advanced early crops.

Potatoes.—Plant early kinds in a dry, warm situation.

Radishes.—Sow on a warm border Early Frame and Long Scarlet, or Early Olive and Scarlet Turnip-rooted. Cover with litter till the plants are above-ground, and afterwards protect at night in severe weather.

Rhubarb.—Make fresh plantations by dividing the roots, with a bud to each. Plant these 3 feet from each other, in rows from 3 to 4 feet apart.

Rocambole.—At the end of the month propagate by planting the cloves of the bulbs 6 inches apart.

Savoys.—From the middle to the end of the month make a sowing of Earliest of All and others to come in early. At the same time Large Green may be sown to attain a large size.

Shallots.—Plant the bulbs in newly-trenched ground at the distance of 6 inches from each other, in shallow drills 1 foot apart.

Spinach.—Seeds of the Round-leaved may be sown between the rows of Peas.

Turnips.—Seeds of Extra Early Milan and Early Snowball may be sown in light, warm soil.

HARDY-FRUIT DEPARTMENT.

All operations, such as trenching, manuring, and otherwise preparing the ground, recommended to be done last month, if not accomplished, owing to the state of the weather or other obstacles, should now be performed as early as possible.

Plant all sorts of fruit-trees at the first opportunity, selecting trees of moderate growth, having clean, healthy-grown stocks. Robust-growing trees cannot be transplanted so successfully, and more time is necessarily required for them to get established, more especially the Apricot, Peach, Nectarine, and Quince, because they push early, and the more vegetation is advanced the greater will be the check from removal, and the less the growth of the trees in the ensuing season. Stake newly-planted trees.

Continue to prune all kinds of fruit-trees except the Fig, Walnut, and Mulberry, which had better be left till danger of severe frost is past. Shoots to be used as grafts may yet be taken off.

Train and nail wall-trees; and in the first place those which are most forward, or which

are on a southern aspect. Beware of over-tight shreds, and do not drive the nails so near the branches as to gall the latter when they increase in size.

Head back stocks, if not already done. Prepare clay for grafting, by mixing it with cowdung and a little fine hay. If the weather be fine towards the end of the month, grafting may be commenced.

Prepare protection for the blossoms of wall-trees. Thin canvas or netting is the best. To keep the blooms strong and hardy, fern or thin straw screens may be used.

Clean the stems of fruit-trees from moss and insects, choosing a moist time for the operation. Use, in the first place, for the moss, a piece of hard-wood with triangular edges; then, with a hard scrubbing-brush, sand, and water, scour off all extraneous matters from the stem. Look out, in pruning, for the eggs of insects glued in rings on the young shoots; remove and effectually destroy them. Syringe Peach-trees after nailing, and before the blossom buds are too far advanced, with sulphur and water thoroughly mixed, or quassia water moderately strong; with this, also, the whole surface of the wall should be well saturated.

Attend to Strawberry plantations: thin old ones that are too thick, and make new ones if necessary.

FORCING DEPARTMENT.

Asparagus.—Keep up a succession, as directed last month, and prepare beds to receive fresh supplies of plants.

Basil.—Sow in pots for early use and for planting out. Pot off plants raised from previous sowing.

Capsicums.—Sow in pots, or on a moderate hot-bed; repot or transplant when the plants have made four or five leaves.

Carrots.—Sow Early Nantes on a slight hot-bed.

Cauliflowers.—Sow a few in pots, or in frames, to be forwarded with a very gentle heat.

Celery.—Sow on a slight hot-bed, or in boxes or pans. Pull out the weakest seedlings.

Egg-plants.—Transplant or repot those sown last month.

Endive.—If required early, sow seeds of Small Green Curled in a heat of 55° or 60°. Transplant when the plants have made four or five leaves, but in gentler heat, where they may become fit for use in May.

Kidney-Beans.—Sow Ne Plus Ultra, Early

Favourite, or any other early dwarf kind, in pots, for succession. Pinch the top shoots to make the plants branch, and water copiously whenever necessary with weak manure-water. In order to keep down red spider, syringe frequently with water a few degrees below the temperature of the house or pit, the air of which should be in a saturated state at the time; a deposition of moisture destructive to the insects will thus be made over the whole surface of the plants.

Lettuce.—Plant a succession on the beds from which the crop has been cleared; too much heat must not be given, between 55° and 60° being sufficient. Sow on a slight hot-bed for a later crop.

Mint.—Continue to force in succession as may be found necessary for ordinary requirements; plant the roots, not too thickly, in boxes 6 inches deep.

Mushrooms.—Means should be taken to bring the heat of beds, previously made, to about 60°, and they may then be spawned.

Onions.—Sow in very gentle heat for transplanting.

Peas.—Those raised in heat must now be hardened, and merely protected from frost and cutting winds.

Potatoes.—Those forwarded in pots, as directed last month, may be planted out on a gentle hot-bed. Some may be transplanted into larger pots.

Radishes.—Sow in gentle heat.

Rhubarb.—Place roots in soil in a forcing-house or pit, and put a large flower-pot over them.

Sea-Kale.—Take up roots of a year's growth from the open ground, and plant in a pit kept completely dark, or pot and force them in a Mushroom-house.

Tomatoes.—Sow seeds in 3-inch pots.

Marjoram.—Sow in pans for planting out.

Sage.—Sow in pots for planting in beds out-of-doors.

Cucumbers.—The soil for these should consist of two parts of light, turfy loam, and one of decomposed manure or leaf-mould. Seedling plants should be placed near the glass to keep them sturdy, and be potted as soon as the seed-leaves are well developed, and repotted again and again, until the soil bed is ready for them. When the roots appear on the surface of the bed, add 2 inches of warmed fresh material to cover and invigorate them, proceed with stopping and training, as required, set the fruit in the ordinary way, and cut it as soon as fit

for use, and maintain plenty of moisture about the plants.

Melons.—Sow for a successional crop. When the plants have run a good distance up the trellis stop them, and the laterals at the second leaf. On these plants the first batch of flowers should be set, and remain for the crop. Maintain 70° by night, 75° to 80° by day, and 85° or 90° by solar-heat, with ventilation.

Pine-Apple.—Prepare soil and keep it in a sufficiently dry condition for potting. Tan and leaves should be at hand in sufficient quantity for a general shift at the end of this or beginning of next month. The bottom-heat may be a little higher than last month, but should not be allowed to get lower. A bottom-heat of 80° will be good for fruiting plants. Encourage plants expected to show fruit shortly by maintaining growing conditions. Moderate syringing will be necessary.

Vines.—Those about to be started may have a somewhat higher temperature than was recommended for plants started last month. In other respects the previous directions will be applicable. With respect to the more advanced, stop and thin the shoots and keep them regularly tied. Those not wanted should be rubbed off early, one shoot from each spur being left, which should have ample room to develop a good growth. Continue to thin bunches where necessary, and the berries likewise whilst they are very young. Keep a moist atmosphere, except when the vines are in flower.

Figs.—These will require attention in respect to water. The terminal buds should be allowed to develop to the required length, but stop other lateral growths a few points above the break. The temperature may now be from 55° to 60° by night, and 65° to 70° by day, and 75° to 85° by sun-heat.

Peaches and Nectarines.—Give continued attention to disbudding and stopping; strong growths will need it repeatedly, in order to reduce the vigour and equalize the flow of sap. If green-fly appears, fumigate at once. The leaves of the trees should be dry when this operation is done.

Cherries.—Guard against too high a temperature; 40° is sufficient at night, and 55° to 60° by day. Give a little top and side air until the house is closed at 55°. If the trees were properly watered at starting, more will not be necessary until growth has advanced considerably.

Strawberries.—Introduce a succession as the plants that have borne their crop are removed.

MARCH.

KITCHEN-GARDEN DEPARTMENT.

If bad weather or other causes have rendered it impossible to carry out the directions given for last month, these should now be proceeded with, and trenching and digging should be hurried on, so that the ground by the end of the month may either be cropped or ready. Weeds should be destroyed, and the surface of the ground occasionally stirred. Clear away worn-out Brussels Sprouts or other winter stuff, and prepare the ground for other crops.

American Cress may be sown.

Angelica.—Transplant that sown in autumn; plant 2 feet apart in moist soil. Seeds may be sown.

Artichokes.—At the end of the month dress the beds, and remove the litter or rotten leaves used for protection. If fresh plantations are required plant the suckers in rows 5 or 6 feet apart, placing them in clumps of three at 4 feet distance in the row, and the suckers 8 or 9 inches from each other in the clump.

Asparagus.—Sow in drills 18 inches apart. New plantations may be made in favourable weather. Plant those roots intended to be grown and lifted for forcing purposes 18 inches apart every way. Permanent beds should be laid out 4 feet wide, with 2-feet alleys between them. Plant two rows of two-year-old crowns in each bed 18 inches apart in the line; and at 1 foot on either side of the central line, after the plants are visible, mulch the surface of the bed with 3 inches of manure in order to keep the soil about the roots moist in dry weather. Dress the beds.

Beans.—Those raised in heat should be transplanted to a warm situation as soon as the weather will permit. Sow full crops of Windsor and Long-Pod as early in the month as possible. Earth up those above-ground.

Beet.—Small sowing of Egyptian Turnip Rooted may be made for early use.

Borecole.—In cold situations sow the principal crop for autumn and winter supply.

Broccoli.—Sow Snow's White Winter early in the month. Some should be sown in a cold frame; also Knight's Protecting and Veitch's Autumn Protecting for pricking out for early planting, more especially if, owing to frost or wet, the soil elsewhere is in bad condition for the seeds.

Brussels Sprouts.—Sow the main crop about

the middle of the month, or in cold localities to form a succession to the August sowing.

Cabbage.—About the end of the month sow Ellam's Early, or Matchless and Early Battersea, for summer and autumn supply.

Cabbage (Red).—Plant out those sown in autumn, and make another sowing for a later supply.

Carrots.—The main crop should be sown about the middle of the month, or as soon after as the weather and state of the ground will permit.

Cauliflower.—Sow in the last fortnight for a late summer crop. Plant out from under hand-glasses those not required to remain, and those likewise which have been protected through the winter. The early sorts should have a warm place, the later varieties in the open quarters.

Celeriac.—Sow in slight heat, or under hand-glasses, on a warm border.

Celery.—If not done in February, the first principal sowing should be made in the first week on gentle heat, and at the end of the month the second main crop should be sown under a frame or hand-light.

Horse-Radish.—Plant pieces of the roots by means of a long dibber, 18 inches long, in well-enriched soil, 1 foot apart in the rows and 18 inches between them. For this purpose the long clear pieces not large enough for use should be selected.

Jerusalem Artichokes.—Plant in rows 3 feet apart, and 1 foot in the row.

Leeks.—Sow the main crop about the middle of the month out-of-doors. Prick out the plants raised in boxes in frames as for Celery.

Lettuce.—Plant out on borders from frames. Sow both Cabbage and Cos varieties in the beginning of the month on a south border.

Onions.—Sow the main crop as early in the month as the ground and the state of the weather will permit in very shallow drills 15 inches apart. Sow Spanish or Silver-skinned for pickling. The ground should be rather poor, firmly trodden, and the seed covered very lightly. Transplant some of those sown in autumn.

Parsley.—Sow seeds in bed or as an edging to a border. The Curled sorts make a neat edging.

Parsnips.—Sow the main crop in drills 1½ inch deep and 18 inches apart. Hollow-crowned and Tender and True are considered the best.

Peas.—Make large sowings of main crop sorts according to the extent of the garden and other circumstances.

Potatoes.—Plant main crop.

Radishes.—Sow for succession.

Rhubarb.—Make fresh plantation by dividing roots which have been forced.

Salsafy.—A little may be sown in drills 12 inches asunder, but not the main crop.

*Savoy*s.—Sow in the middle of the month for autumn use. For a very early supply, Early Ulm may be sown in the beginning of the month.

Scorzonera.—In cold localities sow the main crop in the third week in rows 1 foot apart.

Sea-Kale.—Remove pots as the crop is taken, and place them over other plants to blanch a succession. Sow for a supply of young plants, or otherwise make cuttings of the best roots 6 inches long, and plant in rich soil in rows 8 inches apart and 18 inches asunder, to rear for forcing or for new plantations. Take up those sown in the previous March, and plant 2 feet apart and 8 inches asunder.

Shallots.—Plant early in the month, if not already done.

Spinach.—Sow Round-leaved; this may be done between the widest rows of Peas.

Turnips.—Sow seeds of any early variety in the last fortnight.

HARDY-FRUIT DEPARTMENT.

Finish pruning fruit-trees in which vegetation is most forward. Fig-trees should be completed as soon as possible.

Planting should also be finished without delay, and after planting a mulching of some kind will prove very beneficial when drying winds prevail.

Train and nail trees. Graft Cherry, Plum, Pear, Apple, Chestnut, Quince, and Medlar.

Protect wall-trees with nets, thin canvas, straw screens, spruce branches, fern, or other means at command.

Plantations of Strawberries may be made as early in the month as the state of the ground will permit.

FORCING DEPARTMENT.

Asparagus.—Introduce fresh supplies of roots as former crops become exhausted, to keep up a succession.

*Capsicum*s. — Sow seeds, if not done last month. Pot off the plants when fit, and replace in heat.

Cauliflowers. — Keep the surface soil stirred occasionally about growing plants. Expose

freely, except those left in hand-glasses or frames to give an early supply. Protect only from frost and hail. Weak plants should be removed from amongst the more thriving. Transplant the latter as they become fit, and cover with hand-glasses. Sow seeds for a succession.

Celery.—Sow in pans in rather brisk heat; but as soon as the seeds have germinated remove to gentle heat. Prick out those previously sown.

Egg-plants.—Shift as soon as the plants require larger pots.

Kidney-Beans.—Continue to force in succession. The plants will require a liberal supply of water at the roots and on the foliage. Plant freely in frames having heat at command, as these will come in at a time when they are much required.

Lettuce.—Those in frames should be exposed day and night, unless the weather is severe. Plant out at intervals.

Marjoram (Sweet).—For early use seeds may be sown on a slight hot-bed, either to remain where sown or to be planted out.

Mushrooms.—Maintain a temperature of about 60° in the beds and air, which should also be kept humid.

New Zealand Spinach.—Sow on a gentle hot-bed.

Onions.—Those raised in boxes for transplanting should be gradually exposed to the air to harden them off for planting out.

Peas.—Those forwarded in pots should now be all planted out.

Potatoes.—The soil where the roots extend should not be allowed to get too dry; but that employed for earthing up, and in which the tubers are formed, should be dry and light. Give plenty of air when the weather is favourable. Plant for succession those forwarded in pots or otherwise.

Rhubarb.—Fresh roots may be introduced into the Mushroom-house or any other dark place having a suitable temperature.

Sea-Kale.—Keep up a succession.

Tomatoes.—Seeds may yet be sown. Shift plants into larger pots.

Cucumbers.—Let the bottom-heat be maintained at about 80°, and the temperature of the house between 75° and 80°, or with sun-heat, 85°. Give air as the heat of the day increases, and reduce the amount as it declines. The sashes may even be closed in the afternoon with a rather high temperature from sun-heat. At the time of closing syringe the plants over-

head and all other surfaces in the place. Water with tepid water. Apply manure-water when the plants are in fruit. Thin out the shoots frequently, so as to have but few to remove at any one time.

Melons.—Give air early in the morning to free the leaves of moisture before the sun acts so powerful as to burn them. The flowers must be fertilized when the air of the house is rather dry. Sow seeds for the general crop.

Pine-Apples.—In the planting system two methods are in practice. In one case they are planted on ridges of the best fibrous loam on a bed of oak or beech leaves, as at Frogmore. In the other the bed is heated by hot-water pipes passing through a chamber beneath it. The cultivation in pots is most successfully done by a combination of the above modes, namely, by employing fermenting materials for heat at the roots during the early stages of growth, and artificial heat for fruiting the plants, and finishing them off. Whichever method of cultivation is adopted, it is necessary to start a batch of suckers about the first of March, and a fermenting-bed should be ready at that time with 80° to 90° of heat in it at 15 inches from its surface. Pot suckers according to their size into 7- and 9-inch pots, and plunge them up to the rim. Give no water until new roots are visible at the side of the pot. Keep a moist air about them, and let the heat range from 65° to 70° and 75° by day, and as soon as the pots are fairly filled with roots shift them into fruiting-pots of 10 and 12 inches diameter.

Vines.—Attend to the succession-house as before directed. Tie in shoots before they get entangled; there should be no crowding. Thin the berries, taking care not to prick those intended to remain. If the points of the bunches are taken off, the berries will swell better. Tie up the shoulders of bunches and remove tendrils. Keep a moist atmosphere in the houses at night. Syringe frequently until the vines are in flower, when it should be discontinued. After the thinning is finished, inside borders should receive a liberal supply of tepid manure-water.

Figs.—Remove all suckers. Take care that the roots are regularly supplied with water. Keep the foliage clean by frequent syringing and applications of sulphur.

Peaches and Nectarines.—Remove all superfluous shoots. If any trained in for bearing have failed to produce fruit and are not required, let them be cut back to the lower young shoot if there is one, to be laid in to take its place. Thin the fruit partially at an early

stage, leaving one or more to every square foot, those taking the lead in swelling of course being left in preference. Syringe morning and afternoon and shut up early, allowing a little ventilation at night. Keep the temperature at night at 55° to 60°, with a rise of 10° or 15° on sunny days. Examine the borders, and give manure water plentifully.

Cherries.—When the fruit is set the temperature may be increased to 45° by night and 65° by day, or 70° by sun-heat; but plenty of air must then be admitted. Be careful to supply sufficient moisture to the roots. Syringe the foliage, fumigate for green-fly, and diligently search for and destroy grubs on the leaves.

Strawberries.—Introduce another batch of plants, and follow former directions.

APRIL.

KITCHEN-GARDEN DEPARTMENT.

The weather during this month is generally showery; but sometimes dry easterly winds prevail with cold nights. Under these circumstances watering should be done in the mornings, and then only when absolutely necessary. Stir the surface of the ground among crops whenever it can be done. Weed beds, and hoe and rake the alleys.

Anise.—Sow early in the month.

Artichokes.—Make fresh plantations, if not already done, in good rich soil, as the quality mainly consists in the substance of the heads. Young and large heads are the best, therefore vigorous plants are essential.

Asparagus.—Sow seeds not later than the first or second week. Plant in mild weather, when the ground is in good condition.

Balm.—Divide the roots.

Basil.—Sow seeds on a slight hot-bed.

Beans.—Sow for succession crops; draw earth to plants already up.

Beet.—Sow the main crop from the middle to the end of the month. In dry weather the seeds should be steeped a day before sowing.

Borage.—Sow for succession.

Borecole.—Sow the main crop in the first week.

Broccoli.—Make principal sowings of the late kinds from the first to the third week of the month; sow also Sprouting for early use, and at the end of the month a succession of some late sort. Protect the heads which have formed by bending one or two leaves over them.

Burnet.—Sow seeds and divide old plants.

Cabbage.—Keep the surface soil about growing crops well stirred and free from weeds.

Cardoons.—Sow, about the middle of the month, in patches of three seeds, 18 inches from patch to patch, in well-manured trenches 4 feet apart.

Carraway.—Sow seeds, if not done in autumn. Thin plants to 8 inches apart.

Carrots.—Hoe between the rows of early-sown crops.

Cauliflowers.—Sow in the first fortnight for a late summer crop. As the plants from former sowings become fit, they should be planted out.

Celeriac.—For succession, sow under a hand-glass on a warm border of rich soil.

Celery.—Sow in the second week for late crops. Prick out under glass sufficient for the early crop, and give plenty of water.

Chamomile may be propagated by dividing the roots.

Chervil.—Sow seeds in shallow drills.

Chicory.—Sow thinly, in rows 15 inches apart, for plants to blanch in winter.

Clary.—Sow seeds, if not done last month.

Corn Salad.—Sow seeds for succession.

Dill may be sown.

Endive.—A small quantity of seeds of Small Green Curled may be sown to come in early.

Fennel.—Sow seeds, or plant slips, if not done last month.

Garlic.—Stir the soil between the rows.

Hyssop.—Sow seeds, or propagate by rooted slips or cuttings.

Kidney-Beans.—In the beginning of the month sow a few in a warm soil and situation; also some in pots under protection, in case of the former failing. A fuller crop, for a succession, should be sown about the end of the month.

Lavender.—Sow, or propagate by cuttings and slips.

Leeks.—If the main crop was not sown last month, it should now be done. A late crop may also be sown at the end of the month.

Lettuce.—Sow successions of Cos and Cabbage sorts. Transplant young plants from frames. Tie up plants which are of sufficient size.

Marjoram (Sweet).—Sow seeds on a warm border. (Pot) Divide plants.

Mint.—Propagate by division, and plant out in rich soil in a warm position.

Onions.—If the main crop was not sown last month, the sooner it is done the better. Hoe and thin plants from autumn-sown seeds.

Parsley.—Hamburgh Parsley, which is culti-

vated for its roots, should be sown in the beginning of the month. Sow the curled varieties for garnishing.

Parsnips.—Sow seeds early in the month, if not already done.

Peas.—Continue to sow in succession good breadths of Marrow-fat sorts, such as Ne Plus Ultra and other tall growers, as these withstand the dry summer weather better than dwarfs. The ground should be well manured, and the rows not less than 6 feet apart.

Pennyroyal.—Plant slips.

Potatoes.—Draw earth to the plants as they appear above-ground.

Purslane.—Sow on a warm border broadcast, or in shallow drills 9 inches apart.

Radishes.—Sow successions once a fortnight, or more frequently if necessary.

Rhubarb.—If new plantations are required divide the roots, leaving two or three crowns on each plant. Remove the flower-stems when seed is not to be saved.

Rocamboles.—Plant, if not before done.

Rosemary.—Sow seeds or propagate by slips.

Rue.—Sow seeds, or propagate by cuttings.

Sage.—Propagate by slips in a shady border, and cover with a hand-glass.

Salsafy.—Sow seeds in the end of the month, an inch deep and a foot apart.

Samphire.—Sow seeds, or divide the roots.

Savory (Summer).—Sow early in the month on a warm border. Winter Savory may also then be sown, or it may be propagated by division, or by cuttings of young shoots.

Savoys.—Sow in the middle of the month for late supply.

Scorzonera.—Sow the principal crop in the end of the month.

Scurvy-Grass.—Sow on a cool border.

Sea-Kale.—In the beginning of the month sow seeds, or propagate by root cuttings, if new plantations are required.

Shallots.—Hoe and loosen the soil about the plants.

Skirret.—Sow on rich light soil, and afterwards thin to 6 inches apart.

Sorrel.—Sow seeds or propagate by dividing the roots.

Spinach.—Sow successional batches of Round-leaved.

Tansy.—Divide the roots, if a new plantation be required.

Tarragon.—Propagate by rooted slips; avoid planting in heavy, damp soil.

Thyme.—Sow seeds in light soil, or propagate by division.

Turnips.—Sow successional batches. Hoe and thin out plants already up.

HARDY-FRUIT DEPARTMENT.

It is presumed that the planting and pruning of fruit-trees are now finished, unless delayed by bad weather or other unavoidable causes. The Fig may be pruned in the beginning of the month. Apples and Pears may yet be grafted. Apricots should be thinned. Continue to protect Peaches and Nectarines; but see that the coverings are not producing, by their warmth, tender foliage, that would afterwards suffer from exposure. If such is likely to take place, the protecting materials must be reduced. Disbud sparingly at first when any of the shoots have pushed so far as to require removal.

Attend to newly-grafted trees, and replace the clay if it has dropped off. In case of parching winds, some grafts may require to have moss tied over the clay, and to be kept moist.

See that Apricots and other wall-trees are not dry at the roots. Weed Strawberry plantations, and water them plentifully.

FORCING DEPARTMENT.

Capsicums.—Shift into larger pots; place near the light in some forcing-house.

Carrots.—Expose freely in fine weather. Water so that the extremities of the roots may find sufficient moisture. Keep the foliage clean by syringing.

Cauliflowers.—Moisten well the soil in the frames two days before planting out.

Celery.—Prick out 4 inches apart, on a layer of rotten dung mixed with loam from a Cucumber or Melon bed, laid about 4 inches thick on hard ground. Attend well to the watering of the plants, and shelter if the weather be unfavourable.

Egg-plants.—Train in order that it may form two branches, which should afterwards be stopped to form others. Keep the plants near the light, and give more air as the season advances. Syringe frequently.

Endive.—Sow seeds out-of-doors if necessary, in a warm place.

Kidney-Beans.—Sow for succession.

Lettuce.—Expose freely, day and night, in favourable weather.

Mushrooms.—Collect horse-droppings, and keep them in a thin layer in a dry place till wanted for new beds. Maintain a moist atmosphere in the house, and a temperature of between 60° and 65°.

Onions.—Harden off and transplant those raised in heat.

Potatoes.—Those requiring to be earthed up should be effectually watered beforehand, if needed.

Radishes.—Those forwarded in frames should now be freely exposed to air and sunlight.

Cucumbers.—Maintain the heat previously recommended. If cold north or east winds prevail, take great care not to admit cold currents. Syringe the foliage before closing the house, which should be early in the afternoon. It is necessary to ascertain the condition of the soil, and, if dry, use water at a temperature of about 80°, thoroughly soaking the bed. Train, stop, and regulate the shoots frequently. Sow seeds for ridge plants.

Melons.—Attend to ventilation and water as required. Allow no more shoots to grow than can have the foliage fully exposed to light. Fertilize the female blossoms when the plants are strong enough to bring forward the fruit. The fruit of early crops should be approaching maturity. Avoid wetting the fruits, which tends to cause them to crack. Sow for a succession.

Vegetable Marrows.—Sow seeds for outside planting.

Pine Apples.—Newly-shifted plants should have no water till fresh roots be emitted. Plants ripening their fruit should have a dry atmosphere, with a temperature of 80° by day, and 90° by sun-heat.

Vines.—Attend to stopping and regulating the shoots, as before directed. Maintain a gradually increasing temperature as the berries increase in size. Vines will bear a much wider range of daily temperature than tropical plants will; but at the same time the average temperature to which they are subjected must increase as the crop and season advance.

Figs.—As the fruit swells increase heat and moisture; but the latter must be limited when the fruit is ripening. Lateral growths from the old wood will develop; remove all that are not required, and top all except the terminal ones at the fifth joint.

Peaches and Nectarines.—Tie in the shoots as they grow, and stop those which would become too luxuriant. They may be laid in closely to the naked parts of branches, but ought not to be crowded. Keep the foliage clean by frequent syringing, and the border should be duly watered. Give air in the morning, and reduce it when the temperature from sun-heat begins to decline. By this time early crops will require thinning, although the final operation in this way should

not be done until the stoning process is completed. Use rain-water for syringing.

Cherries.—Be cautious in regard to heat until it is evident the fruit is ripening satisfactorily. As it begins to colour, 70° by sun-heat, and 45° to 50° at night, may be maintained. The fruit should be ripened in a dry atmosphere, or it will crack.

Strawberries.—Manure-water may be given alternately with pure water, unless the plants are inclined to grow too much to leaf. Cut off the upper part of the scape, as before directed, when a sufficient number of fruit is set below.

M A Y.

KITCHEN-GARDEN DEPARTMENT.

Examine all seed-beds, and if there are any failures, sow again immediately. The hoe should now be employed among growing crops. Thinning should take place before the plants crowd each other. Water only when necessary; but it should be done effectually, and preferably in the morning, so that the plants may be dry at night, and less susceptible to damage by frost. After such plentiful watering let the surface of the ground become dry, then hoe and pulverize it, and if this state be maintained, watering will not require to be so soon repeated.

American Cress.—Sow seeds.

Angelica.—Cut down the stems; if allowed to seed, the plant will die soon afterwards.

Asparagus.—The shoots should be regularly cut as they become fit; none should be left to grow up until cutting is discontinued. Take care not to injure the crown of the plants with the knife.

Basil.—Plant out in rich warm soil; shade and water till re-established.

Beans.—Sow successions; earth up and top crops sufficiently advanced.

Beet.—In warm localities sow the main crop in the beginning of the month. Thin early-sown crops.

Borage.—Sow a little seed for succession.

Borecole.—According to the situation, sow from the first to the third week for succession.

Broccoli.—Sow the principal crops of early kinds from the first to the third week, as plants obtained from sowings made at this time are most suitable for rich soils; also successions of the late kinds.

Brussels Sprouts.—Plant out some for early use.

Capsicums.—Some may be planted out in a warm situation, protecting them at night.

Cardoons.—Sow at the beginning of the month, if not done previously.

Carrots.—Thin as soon as the strongest plants can be distinguished, about 6 inches apart; this will allow every alternate one to be drawn for use in a young state, leaving the rest to mature for keeping for winter use. Weed and hoe between the rows of those already up.

Cauliflowers.—The crop for autumn use should be sown before the 24th. Water copiously when the plants require it, and protect formed heads from the sun by breaking leaves over them.

Celery.—Prepare the trenches for an early crop. Abundance of manure should be dug in the bottom of the trenches. Carefully remove all suckers from the plants.

Chervil.—Sow seeds for succession.

Cress.—Make weekly sowings. Plant Water Cress.

Cucumbers.—Prepare ridges for Gherkins, for pickling. The seeds may be sown on the ridges under hand-glasses; or plants, reared in pots for the purpose, may be planted out, if the weather be sufficiently mild. They should be protected at night.

Egg-plants.—Towards the end of the month some of these may be planted out on a rich warm border, at the foot of a south wall.

Endive.—Small sowings may be made at the beginning and end of the month.

Gourds.—Plant out into the open ground, in the end of the month, protecting at night; or sow in the last week, in a warm situation.

Kidney-Beans.—Plant out any raised under glass. Sow the main crop in the first week.

Leeks.—Sow for a late crop, and transplant the earlier sown ones.

Lettuce.—Sow successions of Cos and Cabbage sorts; transplant from seed-beds; tie up plants for blanching.

Marjoram (Sweet).—Plant out on a south border.

Mustard.—Sow frequently.

New Zealand Spinach.—Plant out in the end of the month.

Onions.—Hoe, thin, and weed all beds.

Parsley.—If not done last month, make a successional sowing.

Parsnips.—Hoe, and thin out plants to 8 inches or 1 foot apart.

Peas.—Top the early sorts when they come into bloom; to induce the pods to fill quickly, draw a little earth to those just above-ground.

Sow successions at the early part and end of the month of the best Marrow kinds. Tall growers are recommended for a late crop.

Potatoes.—Hoe between the rows, and earth up such as are above-ground.

Radishes.—Make successional sowings in a shady situation.

Rampion.—Sow about the end of the month, on a shady border of rich earth.

Rhubarb.—Remove flower-stalks as they appear.

Scarlet Runners.—Sow in the first week for the earliest crop; if injured by cold weather, sow later those intended to be staked, at 6 feet apart between the rows; otherwise 3 feet will suffice.

Scorzonera.—Sow a little seed in the course of the month, lest the first sowing should run to seed.

Spinach.—Sow successions. Thin out advanced crops.

Tomatoes.—Plant out against a south wall in the end of the month.

Turnips.—Sow for summer use. Thin out crops sufficiently advanced.

HARDY-FRUIT DEPARTMENT.

Wall-trees must now be carefully inspected—insect pests should be destroyed by syringing the trees with tobacco or quassia water in the mornings of dull, mild days. All shoots not wanted in the more vigorous parts of the tree should be early removed, or topped at the fifth or sixth leaf; those on the weaker parts should be sparingly dealt with, for, whilst they can be left, they tend to establish a stronger flow of sap in the direction most desirable. Shoots left on strong parts, and likely to become over-vigorous, should be stopped when about 6 inches in length, in order to form two shoots of moderate strength. Train and nail shoots as required. At the end of the month thin Apricots, Peaches, and Nectarines. Syringe the trees frequently, early in the morning if the nights are cold, but otherwise about four in the afternoon. Apply sulphur for mildew. Pick off all curled and blistered leaves. See that the soil is sufficiently moist for the roots. Remove suckers. Weed and water Strawberry plantations. Make secure the shoots of budded trees.

FORCING DEPARTMENT.

Basil.—Plant out in the end of the month, on a warm and sheltered border.

Egg-plants.—Those sown in March should now be shifted into larger pots for fruiting under glass, or planted out in a warm situation at the end of the month.

Gourds.—Harden off, and plant out.

Mushrooms.—Maintain a steady temperature and moist atmosphere; little water will then be necessary.

Tomatoes should be hardened off for planting out at the middle of next month. They should be protected at night for some time after planting out.

Cucumbers.—Maintain a steady bottom-heat, and an air temperature of 70° or 75° by night and 80° to 90° on sunny days. Stop the shoots at the second joint and train them regularly about the trellis. Sow in the beginning of the month for frames and hand-glasses.

Melons.—Continue to stop laterals, and set the flowers. Remove all sickly leaves, and see that there be no excess of dryness, either in the soil or the air. If red spider appear, no time should be lost to prevent its increase. When the fruit is ripening, water must be almost entirely withheld, otherwise the flavour would be deteriorated. Shade only when absolutely necessary. Plant out for late crops; some seeds may also be sown.

Pine Apples.—Maintain a steady bottom-heat of from 80° to 90°. The air in the fruiting-house may range from 75° to 85°, rising to 95° by sun-heat. Succession plants may now be allowed plenty of heat and moisture, to promote vigorous growth; the temperature at night should be 70°, with a freer admission of air in the day. Sprinkle the paths, and syringe overhead soon after 3 p.m., all except plants that have ripened their fruit. Shut up immediately after, and closely, if the temperature be not more than 90°. Give manure water alternately with pure water. All suckers except one should be removed from fruiting plants.

Vines.—Fire-heat will be required to maintain a progressively increasing temperature. In houses where the Grapes are approaching maturity, and during the colouring process, and until it is finished, let the laterals grow freely; the temperature at night should not be less than 70°, and it may be allowed to rise to 85° in the day, or 95° by sun-heat. Muscats should have, both night and day, a temperature at least 5° higher. When the Grapes are ripe the temperature should be lowered, with the view of keeping the fruit from shrivelling. The later vineries will require but little fire-heat in fine weather. Give a little air when the tem-

perature rises above 70° in the morning, and increase the amount as the heat of the day may render necessary. Syringe, and nearly shut up in the afternoon with a temperature of 90° by sun-heat. Continue to tie in shoots as they advance in growth. Stop laterals as before directed. When the shoots reach the top of the house, it will, in most cases, be necessary to stop them; but, before doing this, take care that one or two laterals, immediately below where the shoot is to be stopped, are left unstopped, to take the flow of sap, which, deprived of its leading channel, would otherwise be directed to the eyes lower down, and cause them to break into laterals, instead of remaining to push fruit-bearing shoots in the following season. Retain on each plant as much foliage as can be well exposed to light, and no more. Young vines may be planted. Mulch the border with stable manure. Shift vines in pots; and after they make fresh roots, water with manure-water. See that the borders are sufficiently moist.

Figs.—Maintain generally a moist atmosphere; syringe frequently, except when the fruit is ripening. The heat should be well sustained, and a dry airy condition is needful, not only to ripen the fruit but to colour it also. Apply manure-water occasionally, but not if the plants are growing too vigorously. Take care that the plants do not suffer from want of water.

Peaches and Nectarines.—When the fruit is stoned the temperature may be safely raised to 60° minimum and 75° maximum, or with sun-heat to 90°, plenty of air being given at the same time. Continue to tie in the shoots, and not shorten the terminal shoot of bearers. Syringe frequently till the fruit begins to ripen, and shut up rather closely immediately after; but a little air should be kept on even at night. See that the borders are sufficiently moist to induce the fruit to swell freely.

Cherries.—Give plenty of air if needful; water liberally as the fruit approaches maturity. To keep the fruit fresh, shade it from hot sunshine, and keep a current of air passing through the house constantly. When the fruit is gathered, remove the trees in pots outside, and attend well to their being frequently syringed and regularly watered.

Strawberries.—Introduce the latest batch of plants, and treat as formerly directed.

JUNE.

KITCHEN-GARDEN DEPARTMENT.

In earlier months protection from severe cold was necessary, but now the effects of excessively hot and dry weather have to be guarded against. Watering becomes an important operation, but recourse should not be had to it in the open ground, so long as the health of the plants is not endangered. When it is absolutely necessary, it should be done effectually, and continued till rain begins to fall.

Let the surface of the soil occupied by crops be frequently stirred and kept loose. By destroying weeds on their first appearance much labour will be saved.

Asparagus.—Discontinue cutting at mid-summer if possible.

Basil.—Plant out on a warm border.

Beans.—In the beginning of the month a few may be sown for the late crop.

Beet.—Thin young plants to 9 inches apart.

Borecole.—Plant out.

Broccoli.—In the beginning of the month sow for the latest crop, if not before done. Plant out all crops sufficiently advanced, and give plenty of water if the weather be dry.

Brussels Sprouts.—Plant out.

Cabbage.—Plant out before the plants get too large and crowded. Sow seeds of Colewort about the 20th of the month. This vegetable withstands frost, and is indispensable as a source of winter Greens.

Capsicums.—Plant out in a warm situation, in the beginning of the month.

Carrots.—Hoe and thin the more advanced crops.

Cauliflowers.—A few more seeds may be sown, on a rich border, in the beginning of the month, in rows, to be thinned out without transplanting. Plant out successions. Do not allow the plants to suffer from drought; protect heads with leaves.

Celeriac.—Plant out, but not in trenches, in tolerably rich sandy soil.

Celery.—Continue planting out as the plants attain sufficient size. Give plenty of water. Sow a little seed in the beginning of the month for late spring use.

Chervil.—Sow a succession.

Cress.—Keep up a succession by frequent sowing. Plant Water Cress.

Cucumbers.—Sow or plant out on ridges for pickling.

Endive.—Sow the first main crop in the middle of the month.

Kidney-Beans.—Make successional sowings.

Leeks.—Transplant those sown in March.

Lettuce.—Continue sowing and planting out successions. Water frequently in dry weather, and tie up for blanching, as required. Sow Green Paris Cos and other kinds at the end of the month in drills, to be thinned to 6 inches apart.

Mustard.—Make weekly sowings.

New Zealand Spinach.—Plant out in the beginning of the month, if not previously done.

Onions.—Hoe and thin early-sown crops, and encourage growth by watering and stirring the soil about them occasionally.

Orach.—Sow about the middle of the month on rich soil.

Parsnips.—Thin and hoe between rows.

Peas.—Sow, the first week of the month, in rich well-trenched and enriched ground, a good breadth of the Ne Plus Ultra or other tall-growing kind for autumn use. Towards the end of the month make another sowing of tall-growing early varieties.

Potatoes.—Earth up.

Radishes.—Make fresh sowings in a shaded spot.

*Savoy*s.—Plant out towards the end of the month.

Scarlet Runners.—If they are to be run up sticks, these should be put up at once; and those to be kept dwarf will need to be topped occasionally.

Spinach.—Make successional sowings.

Tomatoes.—Plant out, if not already done.

Turnips.—Sow a succession in the beginning, and in cold situations the main winter crop at the end of the month. Hoe and thin previous sowings as they advance.

HARDY-FRUIT DEPARTMENT.

Particular attention must be directed to the summer-pruning of wall-trees, otherwise confusion will take place, and the sap will flow most where it is least wanted; so that a tree which, by proper management, would be everywhere sufficiently, and almost equally vigorous, will exhibit the evil of over-luxuriance in one part and excessive debility in the other.

With respect to Peaches and Nectarines, it is very important to keep the trees free from insects. As the growths proceed, any which are likely to be too vigorous should be pinched at about the sixth leaf; others less strong and

the terminals should be let run without stopping, and lateral growths from these should be pinched at the first leaf. During dry, sunny weather the trees should be syringed at least three times a week.

Pear-trees on walls should have their fore-right shoots pinched or cut back to 6 inches. The most luxuriant shoots of standard and dwarf fruit-trees should also be pinched, where if let alone, they would, by the end of the season, acquire a degree of strength out of proportion with other parts of the tree.

In nailing in the shoots to be retained, take care that the shreds are not too tight. The nails should be driven in no farther than is just sufficient to hold. Let none be driven so near the young fruit as to be likely to touch or gall it when full-grown; many nails employed in the winter nailing will require to be drawn when fruit happens to be too near them.

Syringe wall-trees frequently; until mid-summer it should be done in the morning. Use powdered tobacco-leaves or snuff against green-fly.

Water thoroughly all trees planted last spring, and others that may require it, before they suffer.

Attend to trees grafted in spring, and if they are growing freely the clay will require to be removed and the tie loosened. In many cases the grafts must be again retied, and the shoot supported by a small rod.

FORCING DEPARTMENT.

Egg-plants.—Keep these near the glass; attend to watering, and guard against red spider.

Cucumbers.—Attend to former directions respecting stopping and training. Ventilate early on sunny days, in order to clear the leaves of moisture, or its effect may prove injurious. Water abundantly and frequently with manure-water. When the external temperature is above 75°, with a moist atmosphere or gentle rain, the sashes may be drawn off. Plants in ridges should be stopped, to furnish a sufficient number of shoots.

Melons.—In houses with mixed sorts ripening now, tender-skinned kinds are apt to scald if fully exposed to bright sun; these require shading with tissue-paper. Water abundantly whilst fruit is swelling, until just before ripening commences, when no more water ought to be given. Place supports under the fruit.

If the earliest crop is cleared of fruit the old soil should be removed and the house well cleansed before introducing fresh plants.

Pine-Apples.—For the succession and fruiting plants abundance of heat and moisture should now be supplied. Syringe on sunny days, both morning and evening. Remove suckers, except such as may be required for stock.

Vines.—The temperature may now be 70° by night, 75° to 80° by day, and for Muscats 85° or 90° by sun-heat. A constant circulation of air is so essential that, in order to afford it, a little fire-heat may be necessary, except in very hot weather. But whilst plenty of air is recommended, sweeping draughts must be guarded against. Houses containing ripe Grapes must be kept dry and well aired. When the fruit is gathered the foliage should be well syringed. Water the borders with manure-water. Vines in pots should also be supplied with manure-water. Attend to stopping the shoots, and expose the foliage to as much light as possible. Vineries for very light crops will require little or no fire-heat, except, perhaps, when in flower, should the nights be colder than usual. Stop and regulate the shoots, as previously directed for early crops. Continue to thin the berries, and tie out the shoulders of bunches requiring it.

Figs.—The early crop of fruit will be gathered now; it will therefore be necessary to apply the same treatment as was in force for the early crop until the ripening of the second crop begins. Guard against having the growths so much crowded as to prevent the free operation of sunshine about them. No greater extent of shoots, nor quantity of foliage, should be encouraged than is proportionate to the size of the pots. When the early crop is gathered, syringe the trees twice a day, and give weak manure-water abundantly. Thin out the second crop, reserving the largest fruits near the base of the shoots.

Peaches and Nectarines.—When the fruit is ripening the leaves should be arranged so as to expose it to the sun, in order that it may acquire a fine colour. Attend to the training in of young shoots for next year's bearing; and in order to give them more space, some of the present year's bearing shoots may be cut back to the succession shoot at the base as soon as the fruit is gathered. When the fruit has been gathered, let the trees be well syringed, and all laterals cut off above the first joint at the base.

Cherries.—The trees that have been forced should be occasionally supplied with manure-water, and the foliage should be kept clean by syringing, and those in pots be put out-of-doors

on ashes, and the pots covered with some sort of material to prevent the sun from injuring the roots.

JULY.

KITCHEN-GARDEN DEPARTMENT.

In some seasons this month is excessively hot and dry; in others, heavy thunder-showers fall at intervals, and occasionally it is wet almost throughout. In the first case it will be obvious when watering is necessary; but sudden heavy rains are often deceptive, for they may run off by the surface without reaching the extremities of the roots of plants, and frequently the air becomes drier after these heavy falls than it was before. Under these circumstances vegetation is more apt to suffer than if the drought had been continuous; and therefore watering must be more especially attended to after such rains as do not effectually moisten the ground to a sufficient depth.

Herbs that are fit should be cut and dried; and towards the end of the month some other crops, as Potatoes, early kinds, will probably be sufficiently matured to be taken up to dry for housing.

American Cress may be sown on a shaded border.

Borecole.—Plant out, 2 feet apart, as the plants become fit.

Broccoli.—Finish planting out the principal crops for winter and spring use. Sow Walcheren about the middle of the month for a late spring crop.

Brussels Sprouts.—Plant out principal crops for winter use.

Cabbage.—Plant for autumn use. The principal sowing for autumn planting should be made generally about the 25th; also of Red Cabbage. But in late situations these sowings ought to be made from the 10th to the 15th of the month. Hoe advancing crops, and in exposed situations draw a little earth to the stems.

Cardoons.—Thin the patches so as to leave only the best plant in each. Hoe and water in dry weather.

Carrots.—Sow seeds of the Early Horn for drawing young, and keep the principal crops free from weeds.

Cauliflowers.—Plant out from the May sowing if sufficiently advanced.

Celeriac.—Plant out in the beginning of this month, if not done in the last.



ANTHURIUM SCHERZERIANUM

supply in October. For this purpose the material should be ready by the first week in August.

Cucumbers.—Continue to thin, stop, and regulate shoots. Give manure-water occasionally, and when this is done in frames let the foliage be immediately watered with pure water. In dry weather syringe the leaves twice a day.

Melons.—When the fruit is nearly full-grown let the bed be well watered, so that the plants may not suffer from drought till the ripened fruit is cut. Where hot-water pipes are employed for heating, a regular quantity of moisture in the soil will be maintained by means of the water given to the plants above the heating apparatus; but with regard to dung-beds there is no difficulty in doing so. In fact, when the fermenting materials are duly prepared, the whole being sufficiently moist when put up, water will occasionally be required when necessary. In a fermenting bed of this description there will at this season be ample heat to finish off the crop. Attend to stopping laterals and setting fruit.

Pine-Apples.—The suckers that were started in March, and which had their final shift towards the end of April, will be growing vigorously. Sufficient space should be allowed to secure a sturdy growth. Keep the bottom-heat regular, and, as the roots increase, ventilate and moisten the plants and house as directed. Water with weak guano-water in a tepid state plentifully whenever needful, but before applying it examine the soil in the pots individually. Syringe the foliage two or three times a week, excepting those plants that are ripening their fruit. Plant suckers in 5-inch pots.

Vines.—Vineries in which the fruit is ripe should be kept dry. Those in which the fruit is swelling should be frequently syringed, to keep the foliage healthy and free from red spider; for if this pest is not kept down before the fruit begins to ripen, it cannot possibly be eradicated till after the crop is gathered, and by that time a great amount of injury will have been caused. Endeavour, therefore, to preserve a due degree of moisture in the border, in order that the foliage may be fresh and healthy, even when the fruit is ripe. Laterals may be allowed to grow after the crop is gathered, in order that they may contribute to the formation of roots.

Figs.—When the lateral shoots have grown so that five or six Figs have formed, pinch out the end buds, but let all terminal shoots develop a growth without stopping them. Water regu-

larly, and syringe the foliage. Abundance of air should be given during the day, and a little at night.

Peaches and Nectarines.—As the fruit approaches maturity, all watering must be withheld, and a dry, well-ventilated atmosphere should be maintained. Let the ripening fruit be fully exposed to light by turning aside any leaves that would otherwise shade it. In gathering, very little force should be necessary. Let the base of the fruit be surrounded by the soft tips of all the four fingers and thumb, and the amount of pressure thus applied on five places will be so slight on each that no bruising will result. When the crop is gathered, water the border if necessary, and syringe well the foliage.

AUGUST.

KITCHEN-GARDEN DEPARTMENT.

Attention must now be paid to the sowing of certain crops for autumn, winter, and spring, which comprise Onions, Spinach, Cabbage, Lettuce, and Cauliflower. Onions and Spinach should be sown at the beginning, and again at the middle of the month; Cabbage, for a general crop, on the 8th, Lettuce the 20th, and Cauliflower the 24th. The exact time is of more importance than it is in the case of spring sowings. At that time a week sooner or later is sometimes of little consequence; but in this month there are particular times at which, almost to a day, certain crops must be sown, otherwise they will not attain perfection. If sown a week too early the plants may run to seed, and if as much too late they will not become full-sized.

In dry weather it is well to sow and plant immediately the soil is dug. Seeds cannot vegetate without moisture, yet it is not good to drench them with water, and then allow them to be parched up by the sun's rays. It is better to spread a mat over the bed to prevent the surface from drying till the seeds vegetate, when it must, of course, be taken off; but then the plants had better be shaded from the direct rays of the sun. Herbs for drying should be cut, in a dry day, before the flowers expand, and laid in a dry airy shaded place. Vegetables for pickling should also be gathered when they are quite dry.

Angelica.—Sow as soon as the seeds are ripe; cover them lightly.

Artichokes.—Cut down the stems as the crop is gathered.

Balm.—Gather for drying; it may now be propagated by slips.

Borage.—Sow for late use.

Borecole.—Plant out.

Broccoli.—Plant out for the late crop, and water frequently.

Brussels Sprouts.—In cold northern situations sow for transplanting in spring.

Cabbage.—The principal autumn sowing should be made about the 8th. Plant out those sown for Coleworts.

Cardoons.—Band a few of the earliest with hay or straw, and earth up for blanching.

Carrots.—In the beginning of the month sow Early Horn, for spring use, in a warm sheltered situation.

Cauliflowers.—Sow about the 20th in a frame. Prick out the plants 6 inches apart in a frame or pit, where they are to remain until the spring. Protect from frost whenever necessary, but expose fully when there is no fear of frost. This sowing may be made a little earlier or later, according as the situation is cold or warm. Do not allow them to suffer from drought.

Celeriac.—Suckers should be closely removed from the top of the root.

Celery.—Earth up the early crops as they advance, taking care to keep the hearts of the plants free from soil. Apply lime for slugs, and attend to watering.

Chervil may be sown for succession. Sow the Tuberous-rooted.

Corn Salad.—In the first fortnight sow for winter supply.

Endive.—Sow seeds from the beginning to the middle of the month, and for a late crop plant out from previous sowings; plants sufficiently advanced should be tied up to blanch.

Garlic.—Take up the bulbs when the leaves become yellowish and begin to wither; spread to dry in the sun, but shelter them from rain. When well dried, string them by their withered leaves on a dry straw rope.

Lettuce.—If not done last month, prepare a bed for sowing out-of-doors the first main crop, an important one. From the 15th to the 20th of the month sow such hardy sorts as Hammer-smith Hardy Green and Tennis Ball, for standing the winter in a sheltered situation. Continue to tie up advancing crops.

Onions.—Sow seeds on the first week both for standing the winter and for drawing young; and at the middle of the month make another sowing for succession of the Queen, Early White Naples, and Rocca. Take up the main crop

when ripe, and spread in the sun, on dry ground or gravel, till dry for housing.

Peas.—Those sown last month for the latest crop should be kept well mulched and watered.

Radishes.—Black and White Spanish, for autumn and winter use, may be sown; also some of the Early White and Scarlet Turnip-rooted.

Shallots.—Take up when the leaves begin to wither, and treat in the same way as Garlic.

Spinach.—Sow the main winter crops at the beginning and middle of the month. A large breadth of this useful winter vegetable should be grown.

Tomatoes, placed against a wall or paling, should be kept nailed or stopped. Gather fruit when ripe.

Turnips.—Make a small sowing of the White Stone and other hardy sorts early in the month, for spring use.

HARDY-FRUIT DEPARTMENT.

The gathering of various fruits will require particular attention in this month. Early kinds of Apples and Pears, if gathered a few days too early, will be watery and insipid, and will not become sugary by lying in the fruit-room. If, on the other hand, they are allowed to remain a few days longer on the trees than they ought to do, they become mealy. The time to gather can be readily ascertained by cutting a fruit of Apple or Pear in two pieces, and examining the pips; if brown, the fruit is fit to be gathered. Very early kinds of Apples for a family supply are best gathered as required, because otherwise they lose their freshness. Gooseberries, Currants, Raspberries, and Strawberries are best gathered when cool and dry; but Peaches, Nectarines, Apricots, Plums, and Cherries may be gathered when dry at any time of the day.

Protect Morello Cherries on walls by netting, also Gooseberry and Currant trees, if the fruit is to be preserved to prolong the season. Peach and Nectarine trees should have a number of dry Bean-stalks introduced among the branches to trap ear-wigs. Go over these every morning, and blow the insects out of the Bean-stalks into a bottle half-filled with water; replace the stalks, and continue till the insects are reduced to few or none. Crevices between the soil and the bottom of the wall are highly favourable to insects, such as ants, wood-lice, &c. The soil close to the wall should be frequently stirred.

Continue to train the shoots of wall-trees, nailing them in as may be required; and, as this is

being done, remove nails with which the swelling fruit is likely to come in contact. Shoots having a tendency to grow too strong should be nipped; weak shoots on the lower part of the tree should be left, taking care, however, that they are inclined to the direction in which they must ultimately be nailed.

Some of the early stopped vigorous shoots of Apples and Pears will have pushed a fresh leader; this should be cut back to about 2 inches from its base. Finish budding, and slacken the bands of buds where necessary.

It is now a good time to make plantations of Strawberries. Plant the runners as soon as fit, 18 inches apart in the rows, which should be 3 feet from each other. Shade, if necessary, till the plants get fresh hold, and water according to the state of the weather. Continue to cut off runners, when not required for new plantations. Thin the young shoots of Raspberries, leaving from four to six of the strongest. After the crop is gathered from the bearing branches they should be cut, so that the young shoots for bearing next summer may have all the light and nourishment.

FORCING DEPARTMENT.

Mushrooms.—Prepare dung for beds, and mix one-eighth of good fibrous loam with it. Put enough of it into the beds, so that when it is rammed firmly there will be left 15 inches. Fermentation will follow when the heat of it is from 70° to 80°. Spawn at once, and cover the surface with 2 inches of good loam, and ram it down firm.

Cucumbers.—If the weather is dull and wet, the fires will require to be worked so as to maintain a proper heat. Sow about the middle of the month for winter bearing. Those out-of-doors should be dusted with flowers of sulphur to prevent mildew. Gather for pickling; in general all that are fit should be gathered, from the oldest to the youngest. By so doing a better succession of young fruit will be ensured than if a number of old fruit were allowed to grow.

Melons.—Keep up a steady bottom-heat of 80°, and as much top-heat, with plenty of air. Shade plants which are recently planted for a few days until the roots have taken hold of the soil. Encourage the foliage to become broad and thick in substance. Abundance of air night and day will render it robust. It is better to employ these means than to attempt checking luxuriance by limiting the supply of moisture at the root, for in this case red spider will be en-

couraged. The supply of water must, however, be gradually diminished as the fruit is ripening.

Pine-Apples.—Shifting should be completed before the middle of this month. The bottom-heat should be from 85° to 90°. Water at the root should be withheld till fresh roots are emitted; but the foliage should be daily moistened by syringing. At the time of closing the house the base of the plants should at all times be moderately moist. All suckers that appear on succession plants should be screwed out, leaving only one on each plant when the fruit appears. Suckers, as they can be taken off, should, with others in stock, have the same treatment as recommended for those started last March.

Vines.—Dryness is essential to the keeping of ripe Grapes in good condition, till required for use. Therefore, in dry, clear weather, abundance of air should be given during the day, and a moderate quantity at night; but when the weather is wet, with little or no sunshine to dry up the damp, a little fire-heat, with a free circulation of air at the same time, will have a beneficial effect. Vineries, in which the fruit is swelling, should be kept moist; and this will be difficult in such hot, dry weather as frequently occurs in this month. The paths must be sprinkled, but the foliage not syringed beyond the time the Grapes come into bloom. In such weather, the leaves of a healthy Vine carry off an immense quantity of moisture by evaporation, and they cannot be long healthy if the loss by evaporation is not replaced. Remove superfluous shoots, and unhealthy and decaying berries. Frontignans, when ripe, are apt to shrivel when the bunches are exposed to hot sun, therefore the front ought to be shaded.

Figs.—Plants, on which the fruit is swelling, will require a good supply of water at this season. Once a day will not be generally sufficient, and for those trees in pots the best rule is to give them regularly as much water as they require. The soil in the pots or border should never be dry. Syringe the foliage frequently if red spider make its appearance. When the fruit begins to ripen, gradually reduce the supply of water, and take care that no suckers are allowed to spring up, for the sap will flow to them rather than to the fruiting branches.

Peaches and Nectarines.—When the crop is gathered, see that the border has not become too dry; and if it has, it should be well watered. The trees should be regularly syringed, and air freely admitted, in order to ripen the wood. If the weather is favourable, the lights may be

entirely taken off when growth is properly matured.

Strawberries.—Shift into 5-inch pots those that were layered for forcing. Pot them firmly, and place them on ash-beds in a place where they will have the full force of sunshine and heat. As soon as the roots have filled the pots see that no lack of water is allowed.

SEPTEMBER.

KITCHEN-GARDEN DEPARTMENT.

In dry weather the ground should be kept well hoed, so that not a vestige of weeds may be seen when wet weather sets in. There will then be less occasion to tread and puddle the ground in attempting to destroy weeds when the state of the weather is unfavourable.

Cabbage.—Plant out seedlings from the principal autumn sowing, 2 feet apart each way, to remain for hearting.

Cardoons.—Band, and earth up full-grown plants to blanch.

Cauliflowers.—Encourage growth in the plants by frequently stirring the soil about them.

Celery.—Earth up when the soil is dry.

Corn Salad.—Sow for winter and spring use.

Cress.—Continue to sow the Common; at the beginning of the month sow also Golden, American, and the Curled or Normandy, at the foot of a south wall, to afford a winter and spring supply.

Cucumbers.—Gather for pickling.

Endive.—Plant out successions of Green Curled and Batavian, and tie up for blanching all that are sufficiently advanced.

Leeks.—Draw a little earth to the roots.

Lettuce.—Plant out successions in sheltered situations, and tie up plants as they become fit. Another sowing of the sorts recommended last month may be made towards the middle of this.

Mustard.—Keep up a succession.

Onions.—Take up any that may not have been fit last month. House those that are sufficiently dry.

Parsley.—This is best when planted in frames and protected from frost, for winter use.

Peas.—Water the late crop, if the weather is dry.

Potatoes.—Take up and store.

Radishes.—A small sowing may be made for late supply.

Spinach.—Hoe and thin. If not already done, the winter crop should be sown early in the month.

Turnips.—Hoe and thin.

HARDY-FRUIT DEPARTMENT.

In this month the protection of ripening fruit, and the gathering of it when it is fit, require the most urgent attention. Peaches and Nectarines attract wasps, earwigs, flies, and ants; and in moist weather snails. Earwigs must be trapped in Bean-stalks, as previously directed, and wasps enticed by some sweet beverage into bottles. Wood-lice can be caught readily by means of a little soft hay placed in the bottom of a flower-pot, and ants will be inclined to emigrate if their haunts and hiding-places are daily broken in upon by the hoe and rake; of the latter implement it can also be affirmed that where it has been recently plied along the bottom of the wall and on the border certain bipeds do not like to tread.

All leaves that shade Peaches and Nectarines should be turned aside, so that the fruit may be exposed to the direct rays of the sun. When the fruits are all gathered, the succession shoots should be looked to, and, if any of them are crowded, should be removed to admit light and sun to those left. The shoots of Pear-trees on walls will have pushed again; let these secondary growths be cut back to within 2 inches of their origin. Prepare ground for Strawberry plantations, and plant them—the sooner the better will be advantageous—in the way indicated in a former calendar. Runners may be planted 6 inches apart in nursery beds.

FORCING DEPARTMENT.

Kidney-Beans.—Sow in pots or boxes, or preferably in beds in heated pits, to obtain a good supply for use in November. Let the pots be only partly filled with soil.

Mushrooms.—In this month the spawn naturally vegetates more freely than in any other, and it is the best time for making beds for a supply from November onwards. Prepare materials in dry, airy sheds, and make up fresh beds as required to keep up a supply. Spawn may be introduced when the heat of the bed is 70°. When the heat of the beds declines some time after spawning, cover them over with a layer of straw, which should be removed when the Mushrooms appear. Between 55° and 60° is a good temperature for beds in bearing.

Cucumbers.—The plants raised from seed sown last month for winter bearing should be put into places where heat can be applied when necessary. Sow again at the middle of the month. Keep up the heat for those that are in bearing.

Melons.—In this month the temperature naturally declines to a considerable extent; but fruit, as it approaches maturity, should have an increased rather than a diminished temperature; therefore more artificial heat must be given for this purpose. When the heat is well kept up, more air can be given than would otherwise be the case, and consequently the fruit will be better flavoured. Attend frequently to stopping laterals, so that there may be few to cut out at any one time. Water should be given whenever necessary, and in fine weather the foliage may be sprinkled in mornings with a fine rose.

Pine Apples.—The suckers advised to be potted last month will soon be ready to shift into fruiting-pots; use 10-inch ones for Queens, and 12-inch for strong growers, as Smooth Cayennes and others. Pot firmly in half-decomposed lumpy, fibrous loam, and plunge the pots into a heated bed that will maintain 80° to 90° constantly. At this season water the plants at once, and give no more until such time as they actually require it; examine every pot by hand before giving any more. These plants, under proper treatment, will fruit in succession to those started in March. Fruits that are swelling should have a high and rather moist temperature, with a bottom-heat of 80° to 90°; the top-heat for these may be 75° at night, and from 80° to 90° by day. If the tan has been taken away from the sides of the pots on account of too great heat, let it be replaced as soon as the temperature of the bed falls to 84°. Gradually reduce the supply of moisture as the fruit approaches maturity. Give manure-water to succession plants. Syringe with water of the temperature of 80°. A little air should be given in the morning, but the house should be shut up early in the afternoon.

Vines.—The wood in the earliest vinery ought now to be thoroughly matured. The house should be thrown open night and day, in order to keep the temperature low. Vegetation being thus rendered inactive, the vines should be pruned about the end of October. In doing this, according to the spur method, any of them that are too long should be cut nearly close to the branch from which they proceed. It should be borne in mind that

these vines will be forced into growth at a very unnatural season. It will therefore be wise not to prune them in too closely, but rather leave two or three eyes on every spur-shoot, and more on the terminals or other young rods. In vineries where the Grapes have only just been gathered, and the foliage is not yet decayed, attention must be paid to the ripening of the wood by admitting plenty of air and sun; and a little fire-heat will be necessary when the weather is dull, air being given at the same time. When the fruit is commencing to colour in the latest house, plenty of air must be given during the day, and a moderate quantity at night. This free circulation of air will require fire-heat at night, and occasionally a little through the day. Remove superfluous shoots and laterals, and syringe the foliage, so as to keep it always clean and healthy. Vines in pots may now be started.

Figs.—Attend to former directions as regards a regular and plentiful supply of water, and if the plants are not over-vigorous, manure-water may be given to those on which the fruit is swelling. As the fruit ripens, the supply of water must be reduced.

Peaches and Nectarines.—When the leaves begin to lose their hold, take a fine-twigged broom, and draw it lightly in a direction from the base to the extremities of the shoots, so as not to injure the buds. Repeat this operation at intervals, till the whole are removed. Let all the leaves be picked up from the floor of the house after each brooming. Expose the trees to sun and air. The house should be cleaned and painted if necessary, and likewise the sashes.

OCTOBER.

KITCHEN-GARDEN DEPARTMENT.

Prepare vacant ground for future crops. Remove all fallen and decaying leaves, and continue to hoe, weed, and stir the ground occupied by crops. Dress the herb borders. Draw earth to the stems of the Cabbage tribe.

Beet.—Take up and store in a place somewhat damp, where they will be safe from severe frost.

Cabbage.—Finish planting out for spring use, and for Coleworts.

Cardoons.—Continue to band and earth up for blanching.

Carrots.—Take up part of the crop and store in sand. Clean and thin young crops sown for use early in spring.

Canliflowers.—Prick out where the plants can be protected in winter, either by frames, hand-glasses, or hoops and mats.

Celery.—Continue to earth up. Prepare thatched hurdles, or other materials, for protecting the plants from frost.

Chervil may be sown for spring use.

Chives.—Plant divisions of the roots in patches 6 inches apart.

Corn Salad.—Make the last sowings for winter and spring use.

Cress.—Make the last outdoor sowings. In the middle of the month sow for succession.

Endive.—Continue to plant as it is required for use. The Curled may be blanched by laying tiles over it.

Garlic.—Towards the end of the month plant the cloves, 6 inches apart, in shallow drills 1 foot asunder. Reserve part for another plantation in the spring; if the soil is damp the whole had better be deferred till that season.

Lettuce.—Transplant under hand-glasses on a sloping bed with a southern aspect, or in frames; the main portion of the autumn sowings should be planted out on ridges, on sheltered borders, and at the foot of walls.

Nasturtiums.—Gather for pickling.

Onions.—In wet days look over those stored up, and remove any that may be spoiled.

Potatoes.—Take up and store in narrow ridges. Expose the tubers to light as short a time as possible. Those intended for sets may, on the contrary, be greened in the sun.

Radishes.—A small sowing may be made at the end of the month on a south border, to be protected in winter.

Shallots.—The same remarks apply to this as to Garlic.

Tomatoes.—Gather fruit and hang up in a warm place, or lay them on a hurdle, or on wicker-work, in a frame or vinery. They will there ripen very well, even if green when gathered.

HARDY-FRUIT DEPARTMENT.

Most kinds of Apples and Pears will be fit for gathering in the course of this month. The fruit-room should therefore be prepared to receive them; the finest specimens should be laid out singly, others can be more thickly placed. As many kinds of Apples become sweaty after gathering, it is well to keep the ventilators

open for a time until this condition is over. As a general rule, they should be taken when the fruit readily parts from the spur on being lifted by the hand to a horizontal position. In that case the stalk does not break, but separates at its junction with the spur. But if it does not thus separate, and requires pulling or twisting to break, the fruit is, with some exceptions, not fit for gathering. Care should be taken not to bruise the fruit; it is covered with a sort of bloom or waxy matter which ought not to be rubbed off. Admit air chiefly when the external temperature is equal to that inside the room, or nearly so.

Some kinds of Plums, such as Coe's Golden Drop and Ickworth Impératrice, may be laid in a dry place for a week, and then wrapped in tissue-paper and placed in shallow boxes, in a dry room, till required for use in winter.

Gather Filberts, Medlars, Quinces, and Walnuts. Dry Filberts on hurdles, for packing in jars, with their husks.

Protect the fruit of late Peaches on walls from cold at night.

Collect soil for fruit-tree borders that require to be renewed, or for partial renewal, where trees require to be replaced. Planting may be commenced as soon as the leaves have dropped, but not before, otherwise they evaporate more moisture than the roots can replace, and consequently the shoots become shrivelled.

Propagate Gooseberries and Currants by cuttings, taking care to pick out the eyes from the lower part of the cutting, and as high up as 3 inches above the depth to which it will be inserted in the soil. Make fresh plantations of Raspberries and Strawberries.

FORCING DEPARTMENT.

Chicory.—Take up and plant in pots for forcing, and cover the crowns closely with an inverted pot.

Endive.—Plant under hand-glasses, or in frames.

Kidney-Beans.—Earth up and place near the glass. Give water as they require it, which will be more frequently as the plants advance in growth.

Mushrooms.—Maintain a moist atmosphere by sprinkling the paths and other surfaces within the house. The temperature of the air of the house should be about 55°.

Cucumbers.—Seed sown for winter produce last month, or plants propagated by cuttings for the same purpose, should be put into small

pots at first, and into 5-inch ones afterwards; when these are moderately filled with roots, they should be planted out. It is highly essential that the young plants should be kept as near the glass as possible, without touching it. Without plenty of light they cannot make good growth.

Melons may yet be fruited; but the sun's rays, by which their flavour is chiefly influenced, have now much declined. Keep the plants warm and dry, giving as much air as the state of the weather will permit.

Pine-Apples.—If the bottom-heat is likely to decline below 84°, preparations to renew the bed must be made where tan and dung are used.

The fruiting plants should be put into a house by themselves if possible, where they can have a temperature of 70° at night, and 75° or 80° in the day; or if such accommodation cannot be afforded, they should be placed at the warmest end of the Pine-house. These plants should have manure-water occasionally till the fruit is finished. The temperature for succession plants should be gradually lowered in the course of the month to 60° at night and 70° or 75° by day.

Vines.—The latest vinery, containing late kinds of Grapes that are required for use during the spring months, and onward until new ones are obtained, should, now they are fully ripe, be kept as cool as possible—45° to 50° at night, and a corresponding low temperature in the day. Use as little artificial manure as possible, and dry, airy conditions should prevail in the house. The removal of any decayed berries is necessary. Presuming that the shoots in the earliest house are perfectly matured, the canes should be pruned and all the rough loose bark stripped off. They should then be washed with warm soap-suds. The house should be thoroughly cleaned—the rafters, sashes, and all the wood-work with soft soap, taking care, however, that the latter be washed off the glass. The walls should be whitewashed with lime and sulphur. For early Grapes, the sashes should be refixed about the middle of November and a moist atmosphere maintained. Start them at 55° by night and 65° to 75° by day. Cover the border with a good thickness of materials that will prevent the escape of heat, such as leaves, fern, straw, or long litter. There should be a good thickness laid on, and in a manner that will throw off the cold winter rains.

Figs in houses will by this time be over.

Keep the house freely ventilated and the air about the trees dry, and moderately so about the roots.

Peaches and Nectarines.—Peach-houses should at the end of this month be opened entirely at top and bottom, so that a current of air may be passing through them constantly. When all the leaves are completely cleared off, the trees may be pruned and the house thoroughly cleaned, after which the trees should be retied to the trellis, the surface of the border removed 3 or 4 inches deep, and replaced with fresh material. Over-vigorous trees should be root-pruned or partially lifted at the same time. Give them some fresh loam in a well-mellowed condition.

NOVEMBER.

KITCHEN-GARDEN DEPARTMENT.

It is now advisable to plan for next year's crops, so that as ground becomes cleared it may be properly treated for the kind of crop with which it is to be next planted or sown. Most crops ought to have manure, and some a great deal more than others. Trenching is generally advantageous, and stiff soils in particular should be ridge-trenched. Collect leaves and refuse for manure and other purposes. Prepare protection for such things as Endive, Lettuces, and Celery.

Artichokes.—Towards the end of the month, or before frost sets in, cut off the decayed leaves and stems, if not already done, and surround the plants with several inches of partly-decomposed leaves to protect the crowns from frost.

Asparagus.—Cut down the stems, and clean the beds from weeds.

Beans.—A small sowing of Early Mazagan may be made. Sow in a warm border, in rows 2 feet apart.

Cabbage.—Hoe and clean between the rows; or loosen the soil with small three-pronged drags. Remove all decaying leaves.

Cardoons.—Continue to earth up and protect.

Cauliflowers.—Those that have formed nearly full-sized heads should have a leaf or two broken to afford protection from slight frosts.

Celery.—Continue to earth up, and protect from early frosts, which are frequently succeeded by heavy rains, causing the plants to rot, if previously allowed to be injured by frost.

Endive.—Continue to tie up for blanching.

Remove some from borders, and plant on a dry slope. Protect from frost.

Garlic.—Plant, as directed for the end of last month, if not then done.

Horse-Radish may be planted.

Lettuce.—Fill up gaps among those planted out-of-doors, and protect them from the attacks of slugs, birds, &c. Wood-ashes and soot combined should be dusted on them occasionally.

Sea-Kale.—Remove all decayed leaves.

Shallots.—Plant like Garlic.

Water Cress may be planted for spring use.

HARDY-FRUIT DEPARTMENT.

The hardy fruit-trees generally cultivated are deciduous, and all such trees are best planted when the leaves have fallen. In favourable soils and situations, most fruit-trees may be planted sooner or later in the month. In taking up trees, endeavour to preserve the roots as much as possible. If the tree is large, let a wide and deep opening be made, so that it may be undermined with greater freedom. When taken up, let all bruised rootlets be cut clean off with a sharp knife. Plant as soon as possible after taking up, and as deep as the trees were in the ground before removal. Spread out the fibres, and introduce the soil carefully among them. Water, in order to thoroughly settle the soil among the roots. Standard trees should be staked when planted.

This is the best time for removing and re-planting Pear, Apple, Plum, and Cherry trees, with the view of bringing them soon into a bearing state. In good soil, where these are apt to grow too much to wood, this is a very beneficial proceeding; and in bad subsoils it affords an opportunity of placing the roots which are disposed to penetrate such in a more horizontal direction in the better top soil. In planting wall-trees, let the stems be 6 or 8 inches from the wall, otherwise in growing they will press against it. If, owing to heavy rains, the soil is in bad condition for planting, it may be expedient to defer the operation till next month; or if circumstances should then be unfavourable, it will be better to embrace the earliest opportunity in spring.

Soon after the fall of the leaf, pruning may be commenced as regards the Apricot, Peach, Nectarine, Vine, Plum, Cherry, Pear, and Apple. Gooseberries and Currants should be deferred till later in the season, because birds are sometimes very destructive to the buds. Raspberries, if not pruned last month, should have the number

of canes reduced to five or six, tying them up to stakes as before. After wall-trees are pruned, the wall should be washed, and the trees likewise, taking care, however, that the buds are not injured in any way by the operation. Remove all decayed leaves of wall-trees from the borders, and bury them as manure in other parts of the garden that are being trenched. When the trees are pruned, and all cleaned up at the bottom of the wall, nailing may be proceeded with. Unnail Fig-trees, and tie them in bundles, preparatory to protecting them with spruce branches, fern, or straw.

Attend to the ventilation of the fruit-room, and remove all fruit exhibiting the least symptom of decay.

FORCING DEPARTMENT.

Asparagus.—For directions for forcing this vegetable see p. 400.

Cauliflowers.—Those in frames should be kept hardy by exposure at all times, except in frosty nights or during heavy rains.

Chicory.—Introduce some in pots, and cover with an inverted pot or box of the same size, in a dark place, in gentle heat, to grow and blanch.

Endive.—Take up plants from the open ground, and plant in dry light soil in frames for blanching. A turf pit filled with good light soil, laid sloping, may be planted with Endive, which could be protected with thatched hurdles in severe weather.

Kidney-Beans.—Sow in succession. When the plants come up, place them as near the light as possible. Fill up the pots as the plants advance.

Lettuce.—The frames should be fully exposed on fine days, and well protected in frosty weather.

Mint.—Plant some roots in pots or boxes; the former are the more convenient for moving into any spare warm corner.

Mushrooms.—Prepare beds for succession. After the beds are spawned cover them with 3 inches of loam, and ram it down hard. Attend to sprinkling the floor, so as to maintain a proper degree of moisture in the atmosphere.

Radishes.—Sow in frames, and as soon as the plants appear give them plenty of air; or in the open air, in a bed hooped over, ready to support a covering in case of frost or other inclement weather.

Rhubarb.—Roots may now be taken up and forced in any warm place that may be found convenient, whether in frames or the Mush-

room-house. Lift the roots carefully, and plant them in light rich soil; wall up about the crowns, as from here roots will start that give great support in the forcing process.

Sea-Kale.—Take up young roots in preference to two- or three-year-old plants raised on purpose, and plant in light soil in boxes 1 foot deep; give water when planted, and place in a warm frame, Mushroom-house, or elsewhere, in a temperature of about 60°.

Cucumbers.—Those sown in the end of September will now require to be planted in the houses where they are to fruit. Keep the glass of the sashes clean, so as to admit as much light as possible. Maintain a bottom-heat of 75°, and a top-heat of about the same; but this may rise to 80° with sun-heat, air being admitted at the same time. Water the beds in the early part of the day, taking care that the temperature of the water is about 75°.

Pine-Apples.—Growth in young plants and suckers should not be prolonged, but be kept in a low temperature—58° as a mean at night, and 55° when suckers are placed to be wintered for restarting into growth again in the spring. In both cases 65° during daylight will amply suffice. At 70° a crack of air for an hour or two will be productive of much good. The bottom-heat should not, in the case of successional plants, be allowed to fall below 75°, and for suckers 65°. Under these conditions the watering should be done by an experienced hand, as injury is a certain consequence of too much water. Fruiting plants will require a higher temperature, say 75°, and a good supply of moisture at the roots. The house should be kept tolerably moist by sprinkling the floor and the plants occasionally.

Vines.—The mean temperature of this month is, on the average, little above 40°; and the air is generally saturated with moisture. Under these conditions the hot-water pipes should be kept warm, and a crack of air left on constantly at the apex of the house will cause a circulation that will prevent any ill effects from external influences. If the nights are cold, the temperature of the house should not be allowed to fall lower than 55°.

The house in which forcing is to be commenced for the earliest crop, or to have fruit ripe in April, should be shut up at the beginning of the month. As a higher temperature will be required to start the canes at this season than in spring, the temperature may be, when the house is first shut up, from 50° to 55° at night and 60° to 65° by day, and 70° to 75° by sun-heat.

Syringe the canes twice a day, and sprinkle the paths and other surfaces occasionally, so as to maintain a moist atmosphere. If plants in pots have been started for very early fruit, the shoots should be stopped at the second leaf above the branch. After the leading shoot is stopped, the subsequent laterals from it and on all other growths should be pinched at the first or second leaf. This is very necessary to obtain early Grapes.

Figs.—After the crop is gathered, the plants should be gradually subjected to a lower temperature, and then shifted if necessary; or at all events the top soil should be taken off and replaced with fresh. The pots should then be placed in an airy house or shed, where the temperature can be prevented from ever falling below 40°. Of course, water will scarcely be required under these circumstances, but the roots must not be allowed to get too dry. If early ripe fruit is required, the plants should be brought into heat this month and be subjected to the same conditions as recommended for early Grapes.

Peaches and Nectarines.—The trees should be freely exposed to the air. The sashes may even be taken off in the early part of the month, and this will afford a convenient opportunity to repair and paint them. If ripe fruit is required early next May the house should be closed about the middle of November. No fire-heat need be applied during the first fortnight unless frosty weather necessitates it, when the night temperature should be kept at 45° to 50°, and 60° to 65° in the day. On fine days liberally ventilate in the daytime. Syringe the trees twice daily if they become dry. A gradual start is recommended as a means to prevent the buds from dropping, which sometimes results from this cause, or otherwise from the soil about the roots having become too dry during the term of maturation.

Cherries.—Examine the trees, and shift all those requiring more room for their roots into larger pots or tubs. Top-dress the others. Plunge in leaves, or otherwise mulch, so as to protect the roots from frost. To free the trees of any insects that may abound in a dormant state, they should be washed over with soft-soap water in a weak state. The house should also be thoroughly cleansed and lime-washed over. After other operations, such as tying, are completed, they will be ready for starting.

Strawberries.—The pots should be protected from frost, and also from heavy rains, which would wash the nutritive qualities out of the soil, unless the rain pass through a mulching of

leaves or long dung. The pots may therefore be placed under a roof or in a frame. Start a batch at the end of the month in a temperature of 50° to 55°.

DECEMBER.

KITCHEN-GARDEN DEPARTMENT.

In this month there are usually frosts severe enough to harden the ground, so that it is fit to be wheeled upon. Advantage should be taken of that condition to distribute manure where it is wanted. Frost generally is beneficial; but, on the other hand, its injurious effects must be guarded against, especially when it is severe.

Collect all decaying substances in heaps for manure, and these may be turned when the ground, either from frost or wet, is not in a condition to be worked. These substances should be improved by having some slaked lime and soot incorporated with them, and by turning and mixing be brought into a state of fermentation before they are put on the ground. In wet weather diligently forward all work that can be done indoors, so that it may not be to do when the weather is fine. Pea-sticks cut before the sap rises are stronger, and not so apt to rot, as those cut after it begins to move. They should therefore be now brought in and prepared, sorting them into lengths to suit the respective heights to which the different kinds of Peas grow. Then tie them up in bundles that can be conveniently carried, and place them under cover, but where air may freely circulate, till they are required for use. In bad weather tallies should be prepared for painting, to be afterwards written with the names of seeds sown, or crops planted.

Beans.—Draw earth to the stems of those a little above-ground to protect them. Another sowing of early hardy kinds may be made.

Celery.—Finally earth up on dry days; but if the soil is of a heavy nature, some that is light and dry should be put next to the plants, placing it against them with the hand. Protect from frost with straw or litter, which can be removed when the weather is fine.

Endive.—Continue to blanch in succession. Protect with flower-pots or otherwise; likewise take up some and plant in sheds or frames.

Jerusalem Artichokes.—These may be taken up as required fresh out of the ground; but, in

case of frost, the latter should be covered over with litter.

Onions.—Pick over those that are housed. Keep them cool, but protect from frost. Potato Onions may be planted.

Parsley.—In case of frost, a portion of the bed should have a frame or other protection placed over it.

Peas.—Draw some earth to those a little above-ground. Sow a succession. Guard against the attacks of mice.

HARDY-FRUIT DEPARTMENT.

The planting of all sorts of fruit-trees recommended to be done last month, but not completed, should be proceeded with as early as possible in this, provided the soil is in proper condition—that is to say, neither too wet nor frozen. Pieces of frozen crust, thrown in with the soil in planting, condense moisture, owing to their coldness, and form wet chilling masses even after being thawed. This kind of moisture, in contact with the roots, is unquestionably worse for them than that from drenching rains.

Continue to trench and prepare ground for planting, and to make new borders where such are required, or renew old ones. This is also a good time to trench in advance of the roots of wall-trees that have commenced bearing, introducing at the same time some new soil. Mulch newly-planted trees, and stake any likely to be shaken out of position by the wind. Continue to prune all sorts of fruit-trees, except Figs and Nuts. If the shoots of Peaches and Nectarines on an east or west aspect are green and immature, the pruning of them may be deferred till early in spring. Old trees, intended to be re-grafted, should now be headed back. Their branches should be sawn off almost close to the place where each can be most conveniently grafted. When Gooseberry and Currant trees are pruned, and the cuttings raked off, manure should be wheeled between the rows, and dug in; but in doing this the surface should be drawn clean away from near the stems, and buried in the middle of the space between the rows.

Clean trees from moss. After wet weather their stems and the naked parts of branches can be easily scraped, scrubbed, and washed clean.

Nail wall-trees in favourable weather. See that no more nails are used than are absolutely required, and that they are driven not into the

faces of the bricks, but into the mortar, and no further into it than is necessary to ensure sufficient hold. Nails, whether new or old, should be heated, and plunged when under a red heat in linseed-oil. Old shreds that have been picked out as being again fit to be used, should be boiled, to kill insects, then thoroughly dried, and laid aside till wanted.

The fruit-room should be kept close constantly. Remove all speckled and decaying fruit, but in so doing disturb as little as possible that which is sound.

FORCING DEPARTMENT.

Asparagus.—Continue to maintain a bottom-heat of from 60° to 70°, and when the shoots have started, the soil may be watered according as it may be necessary; but the water should not be cold, as in that state it would check the growth. It should be brought to a temperature of about 65°. Add some more light dry soil, and when the shoots appear admit air and light, the latter being necessary that the shoots may acquire the natural green and give it flavour. Keep up a temperature of 65° constantly, and encourage growth by ordinary means. Cut the grass when it is about 4 inches high. Asparagus that is being forced on established beds should have the linings turned when the heat is likely to fall below the degree above mentioned; and before the shoots advance so far as to be in danger of injury, the soil in the frame should be forked over and finally broken. Water, probably, will not be required; but if it should, to gently moisten the surface, attend to the directions for its application to Asparagus in frames. Prepare for forcing a succession.

Cauliflowers.—Protect from severe cold so as to keep the plants from being checked; but, on the other hand, take care not to render them tender by keeping them too warm.

Chicory.—Take up roots, and plant for succession, as before directed.

Cress.—Keep up a supply by sowing in boxes placed in heat.

Endive.—Give plenty of air to those growing in protecting frames, and tie it up if necessary to blanching.

Kidney-Beans.—Sow in succession.

Lettuce.—Keep the glass clean, in order that it may transmit the more light to the plants. Give air freely in all favourable weather.

Mint.—Plant in pots or boxes for forcing.

Mushrooms.—Attend to former directions as

regards a moist atmosphere in the house. Any in ridges out-of-doors will require to be thickly covered with litter and mats.

Mustard.—Sow, and place in heat.

Radishes.—Prepare a slight hot-bed. Cover it with several inches of rich compost, over which lay 5 or 6 inches of light soil, and in this, when the bed is at a proper temperature, 60° to 70°, sow Early Scarlet, Wood's Frame, or French Breakfast. The frame should be so far made up with the dung and soil as to have the surface of the latter near the glass. Give air when the plants come up, and take care that they are thinned in time.

Rhubarb.—Roots should be taken up every fortnight or three weeks, and put in heat for a succession, or fermenting materials may be used for forcing plants in the ground under a large inverted flower-pot.

Sea-Kale.—The same remarks as for Rhubarb are applicable to this.

Cucumbers.—A bottom-heat of 75° was recommended last month for those planted out in pits or houses. Through the winter months these plants want careful attention, also plenty of light, heat, and moisture; without these elements success will be dubious. The top-heat about the same, or as much as 80° with sun-heat and air. As the plants advance let these temperatures be fully maintained, especially if the days are clear. In this case the heat may be increased 5°; but it would be desirable that once every day the top-heat should be higher than the bottom-heat, and if this can be effected by sun-heat, and the house closed up under its influence at 80°, so much the better. To maintain the plants in a vigorous state under existing conditions, they should not be over-cropped now. By this practice a better crop will be ensured later on, when they are in greater request. Air should be carefully admitted at all times. The plants should be as near the glass as possible. Attend to stopping and training. If the foliage is allowed to get crowded, a portion of the leaves will acquire a yellowish tinge, and will soon become worse than useless. Be careful, therefore, to prevent this. Ascertain that the water supplied is of the proper temperature, 75°, or not higher than 80°. Cucumbers in boxes or otherwise should have occasionally tepid manure-water. A seed-bed, adapted for a one-light box, may be prepared for raising Cucumber plants, &c.

Pine-Apples.—The temperature recommended for last month should be continued. The restarting of suckers or other young plants should

be deferred until the end of February. Plants that are swelling fruit should have water in proportion to the demand which a high temperature will occasion. Syringe, and shut up with a hot, moist atmosphere.

Vines.—The temperature of the house started last month should be kept gradually on the increase—65° to 70° by day, and from 55° to 60° by night. Fire-heat will be required, especially at night. The pipes, if not overheated, and pathways, must be frequently sprinkled to produce a moist atmosphere, and the stems should be syringed with water of the same temperature as the air of the house twice daily. If the Vines have been planted outside, take care that the exposed portion of the stem is well protected from cold; but dung should not be allowed to come in contact with it, and whilst care is taken to protect the outside portion, that which is inside must also be protected from the heat from the pipes over which it may be situated. A screen of some material that is a slow conductor of heat should therefore be placed between it and the pipes. Very little air will be required till the buds begin to break, but it must then be given at every favourable opportunity; and if any of the canes have been bent down, with the view of inducing them to break near the bottom, they must be put on the trellis directly the object for which they were bent is accomplished. As soon as fruitful growths are plainly visible, rub all off except the most promising one; this should be stopped at the second leaf above the bunch.

Figs.—A few plants in pots may be plunged in moderate bottom-heat, say 55°, or they may

be placed on fermenting materials if such have been introduced on the floor of the early vinery. The plants to be thus forwarded at this season need not be large; for the Fig can be fruited although kept in small compass, provided the extent of foliage has been kept in such limited proportion as to correspond with the space allowed for its roots, and when growth commences a place near the glass is indispensable to ensure success.

Peaches and Nectarines.—The temperature of the earliest house should be kept so as to induce a gradually progressive vegetation in the trees; for these will not bear to be rapidly forced in the early stage of the process. The temperature at night should be 50°, and from 55° to 60° during the day, and it may be allowed to rise to 65° or 70° by the influence of sun-heat; but abundance of air must be given. Sprinkle the trees with tepid water mornings and afternoons, and continue this till the flower-buds begin to open, when it should be continued in a moderate way on fine sunny days; also take advantage of fine dry days to impregnate the blossoms which are open and fit for the operation.

Cherries.—The trees should be taken in and the house shut up, but the temperature must be kept very moderate. About 40° at night will be sufficient in the first instance, and 55° by day or 60° by sun-heat, plenty of air being then admitted. Cherry-trees in pots do better without bottom-heat.

Strawberries.—Protect the pots from frost. Some plants may be introduced into the Peach-house or other suitable place.

[G. T. M.]

APPENDIX

ON THE COLLECTING, STORING, AND PACKING OF VEGETABLES

Large quantities of vegetables are spoilt either by collecting them too early or too late, by faulty storing, or by bad packing. There is a certain stage in the life of every vegetable when it is at its best for human consumption. If this period is anticipated the best qualities cannot be brought out by those cooking or preparing them for use, while on the other hand the period of collecting may be too long deferred, and coarseness, or lack of tenderness, has to be obviated by means not conducive to their wholesomeness when cooked. It is very certain that vegetables cannot well be too fresh, and that is where home-grown produce has, or ought to have, a decided advantage over any purchased. At times it becomes imperative to collect vegetables before they are really required for use, or otherwise they will spoil where grown, whereas, when stored for a long or short period, as the case may be, they can be retarded in some instances and protected from bad weather in others.

Too much care cannot be taken in selecting, grading, bunching, and packing vegetables, whether they are to be marketed or sent to their owner's town or sea-side house. Directions for the most important vegetables in regard to the time to collect them, either for immediate consumption, or for storing or for packing them to be sent a long journey, are given here:—

Artichoke.—The Globe section, grown exclusively for their flower-heads, should not have these cut for use before the scales are fully unfolded. It would be a mistake to cut them when no more than half-grown, or to leave them till they are opening in the centre. As soon as a few of the outer scales open, cut the heads with a short length of stalk attached, and if not wanted for use the same day stand them in a pan of water in a cool dark place. As severe frost damages them, they require protection of some kind, if not cut and stored as advised.

Globe Artichokes bruise rather easily; it is well, therefore, to take some pains in packing

them. If laid flat and close in fresh long grass, fixing them tightly in the hamper or box with more of the same or some kind of soft green vegetable, they will travel safely. The same pains should be taken in packing for market.

JERUSALEM ARTICHOKEs keep best when left in the ground where grown, digging them as required. In order to be able to accomplish this during severe frost, cover a portion of the bed with straw litter. When the tubers are sprouting, or say late in March, what remains of the crop should be lifted, cleared of shoots, and stored in moist sand and cool quarters.

Very large tubers are not desirable. The white-skinned variety is usually preferred. It will not harm the roots if they are first washed and then packed loosely in the bottom of hampers, and they may be sent to the markets in bags in the same way as Potatoes.

Stachys tuberifera, commonly called Chinese Artichoke, form small spiral tubers which are available for use during autumn and winter. If the tubers are exposed to the atmosphere for a few days they quickly shrivel and become valueless. They ought, then, to be left in the ground, protected with strawy litter, and in the spring what are still under should be lifted and at once stored in sand. Enclosed in paper bags they can be sent any distance in ordinary mixed vegetable hampers.

Asparagus.—Shoots of Asparagus cannot well be too long, always providing the points are not unduly developed. It is also desirable that a good portion of the stalks should be blanched, not necessarily because this is a sign of good quality, but rather because they look better. The greater part of the shoots should be eatable and not blanched and stringy. French Asparagus is very large and blanched to nearly its full length by high culture and by heavily mounding over the plants with light soil. Too often English-grown plants are not planted deep enough, and the produce would be greatly improved if the shoots had to come through at

least 3 inches of light soil. The same remark applies also to forced Asparagus. The shoots should be carefully cut, washed, graded, and bunched. If the various sizes are mixed indiscriminately the whole cutting would be considered second-rate both by buyers and cooks, and if cooked in a similar haphazard fashion some of the shoots would be overdone and others probably not sufficiently boiled. It is a good plan to make three sizes—extra-fine, medium, and small—the latter, known as “sprue”, doing good duty in soups. Bunch them up neatly, in from fifty to one hundred shoots, according to circumstances, taking care to have all the points level, the stalks being duly shortened to near one length. Market-growers use a simple little contrivance for arranging the shoots. If not wanted for immediate use, the bunches may be stood in shallow pans of water in a cool dark shed for one or two days, but it should be borne in mind that fresh-cut Asparagus is the best.

In packing the shoots great care must be taken not to damage the points. Small quantities may be wrapped in paper and placed in layers, with the base of the shoots against the ends of the box in which they are packed. Larger quantities may be packed surrounded by fresh long grass, in “flats” or shallow hampers with lids, filling the package so that the lid when closed will hold the contents in position.

Beans.—Broad Beans ought to be gathered when the seeds in the pods are not more than two-thirds grown; some prefer them when only half-grown. They can be kept fresh for about two days in a cool dark shed. They are easily packed. A corner not far from the top of a mixed hamper may be devoted to them, while the earliest are sent to the markets in half-sieves and bushel-sieves, later heavier supplies being consigned in bags of two bushels.

Dwarf French or Kidney Beans grown under glass ought to be gathered as soon as they approach full size, not leaving them long enough to become stringy, which they may do in a few hours. Grade and tie them up neatly in bundles of fifty or so, the stalks being level so that they all touch the water in the pans they are stood in till required. They are not so tender after standing two or three days in water. Pack the bundles flat and in boxes with other choice vegetables, and if they can be surrounded with Spinach leaves so much the better. When more plentiful, and grown in the open, they are not bundled.

Runner Beans should also be kept somewhat closely gathered, and certainly never left on the plants till the pods present a swollen appearance. They travel well packed with other vegetables, always providing nothing heavy or rough is placed over them. Those intended for the markets are packed in half-sieves and bushel-sieves, heaped measure usually being given, a covering of long grass, kept in place by stout benders, completing the packing. Later in the season they are packed and despatched in two-bushel bags.

Beet.—The Turnip-rooted are fit for use first, the first to become stringy, and they ought to be used first. They should be well washed before sending to the kitchen. The tap-rooted varieties ought to be lifted carefully, to avoid breaking the coarser side-roots, damaged Beet losing much of its attractive colouring when boiled. Severe frost, if it does not actually destroy Beet, is liable to seriously impair the quality, so that lifting and storing in October is always advisable. Do not cut but twist off the tops, and clear the roots of soil clinging to them. Store in cone-shaped mounds, crowns outwards, surrounding the roots with sand, fine soil, or ashes, and covering with fresh straw, in its turn covered heavily with soil. Provision should be made for an escape of what little vapour may form during the first weeks, and the position selected for the heap ought to be well drained, while rats should be watched for and destroyed. Beet may also be stored in a cool, dry, dark shed or cool cellar, and in some instances will keep fresh and plump without a covering of sand or soil. Beetroot is marketed either by the bushel-basket or loosely by the tally of sixty.

Borecole.—Those who would prolong the supply of greens should keep gathering them closely whether required for use or not. Once the shoots harden for flowering it is not much use leaving the plants on the ground. Borecole tops are packed flat in hampers, while the side-shoots or greens are often used for surrounding choicer vegetables near to or quite on the top of the hamper. Tops are usually marketed in sieves and crates, and the greens in bags.

Broccoli.—At all times coarser than Cauli-flowers, this difference becomes still further emphasized when no pains are taken in keeping the least self-protecting well covered with some of the leaves of the plants—duly snapped off and tucked closely over the curds. Thus covered

they remain fairly clean and white in appearance and consequently worth more. Medium-sized to small whole heads are best for the table, and the Broccoli must, therefore, be cut before it has attained to its full dimensions. This applies more especially to produce grown for home consumption. Autumn Broccoli pays well for lifting with some soil about the roots and storing somewhat closely in deep pits or beds in cool houses or temporary frames, where they will give a long succession of useful heads. Main and late crops may be retarded by lifting in April and replanting in a north border, disposing the plants rather closely in a sloping direction and firmly packing rich soil about the roots. This is better than suspending the plants, with hearts partially developed, in cool dark cellars.

Broccoli that is to be packed ought not to be entirely denuded of leaves, enough being left to protect the hearts. Pack closely and on their sides, somewhere about the middle of a large hamper of vegetables. Whole train-loads of crates of Broccoli are despatched from Cornwall to other parts of the country during the winter season.

Brussels Sprouts.—Coarseness in these is decidedly objectionable, medium-sized to small close Sprouts only finding favour with cooks in good establishments. They ought to be cut or snapped off, not stripped away with a portion of the stem attached, and the stumps thus formed produce a second crop of small Sprouts, and later on an abundance of greens. Do not cut the Cabbage-like top off the plants before midwinter, as these serve to protect and assist in the production of Sprouts on the upper portion of the stems. Brussels Sprouts retain their freshness several days after collecting. They may be packed loosely in one corner of the middle or top layer of a hamper of mixed vegetables, while those marketed are usually packed in half-sieves, sieves, and frequently bags. Entire plants are marketed in some districts.

Cabbages.—It is a mistake to defer cutting till the hearts are solid; neat, little, quickly-grown, and not very solid, conical hearts being preferred, the earliest spring supplies in particular finding favour. Cabbages do not keep well cut, and they are seldom stored in pits for winter use. They are cleared of their coarser leaves and packed and marketed either by the tally or in crates similarly to Broccoli. Collards, or Coleworts, are bunched.

Cardoon.—As this plant is not hardy, and is rather bulky to store, it is a good plan to protect the rows, before the tops are injured by frost, with bracken or strawy litter. If preferred the plants may be lifted and replanted close together where they can be conveniently got at. If proper means have not been taken to keep the stocks clear of soil, they must be washed carefully, holding the hearts downwards. Before packing, trim freely, tie the stalks together, and pack them firmly.

Carrots.—Young whole Carrots are the sweetest and tenderest when cooked, but medium-sized old roots can also be cooked whole and till they are tender and sweet. The coarser roots should go to the stables. Young Carrots are bunched, their tops reduced, and are then well rinsed in water. Roots intended for storing should be lifted before they are injured by severe frost, cleared of soil, and have their tops cut back to the crowns. Store exactly as advised for Beet. Pack them close together in the bottom of a mixed hamper. Their appearance is improved by careful washing, avoiding the use of a stiff brush, which may disfigure the skins. Any to be marketed should be graded, and they may be despatched in bags holding one hundredweight or more.

Cauliflowers.—In order to ensure perfect blanching of the curds and to a certain extent exclude butterflies followed by obnoxious caterpillars, tie the leaves of advancing Cauliflowers over their hearts somewhat closely. Cut while the curds are still close and solid, shorten the outer leaf-stalks, and retain the inner protecting leaves. Autumn crops may be lifted, stored, or otherwise protected, much as advised for early Broccoli. They are also packed and marketed in the same way.

Celeriac.—This, the Turnip-rooted Celery, being grown completely on the surface of the ground, must either be protected or lifted and stored where they will be safe from frost. Fresh oak or beech leaves banked up over them will ward off frost, or the roots may be lifted, cleared of their tops, and be stored in sand in a cool shed.

Celery.—The plants, after lifting, should be cleared of the coarser outside stalks and roots, and then be tied firmly to keep them in shape. For packing, rather more of the leaves should be trimmed off, and they can then be laid

closely together in a mixed hamper, somewhere about the middle layer. For the markets the plants are trimmed moderately hard, washed carefully heart downwards, and, in addition to each receiving one tie near the top, they are also bunched into flat neat bundles of six, nine, or twelve. With a little practice men become expert in this bunching of Celery, and during the season many are wholly employed in preparing this important crop for the markets.

In America late Celery is lifted, slightly trimmed, and bedded in pits, where a heavy protection of straw can be given. In this country there is less need for this precaution, but it is well to protect with fresh, dry bracken or strawy litter when a severe midwinter frost is anticipated.

Chicory.—Well-blanchd tops of these can be best produced from strong roots in a Mushroom-house. For home use the leaves only may be cut, and successional supplies be had from the hearts, but for travelling and marketing the tops should be cut before they spread, each with a thin part of the crown of the root attached, to keep the tops together. Pack them with other tender vegetables in strong boxes, these in their turn being placed in the bottom of a large hamper. If intended for the markets pack them in flats.

Cucumbers.—These, to be wholesome, must be grown quickly, and not be left hanging on the plants till the skins have thickened and lost their fresh dark-green appearance. Nor do they, as a rule, keep well off the plants, the one noteworthy exception being Rochford Market, otherwise known as Covent Garden Perfection, which retains a fresh appearance for five or six days after cutting. If not wanted for immediate use, cut before they are too old, and stand them upright in a cool dark shed with their foot-stalks in pans of water. Thus treated, however, they are apt to become somewhat hard. For cooking purposes Cucumbers may be allowed to hang rather longer on the plants.

When handling Cucumbers be careful to preserve the bloom on the skins as much as possible, and when packing, wrap each Cucumber separately in soft paper and pack closely in a box. For the markets they are usually packed in flats, or shallow baskets, with long fresh grass between the layers, topping up with more of the same, the lid closing down tightly on this. Ridge Cucumbers are not so easily disfigured, and may be packed in any kind of basket with-

out much packing material, except for the purpose of topping up.

Endive.—Healthy, well-blanchd, clean hearts of Endive rarely fail of appreciation. Large batches, unless for market purposes, ought not to be blanchd at one time, blanchd Endive not keeping well. It should not be cut long before it is wanted for use. If it is to be packed, be careful to cut a portion of the underground stem with the plant, the better to keep it together, and pack closely on their sides in baskets or boxes, protecting the hearts with some of their outer leaves drawn up rather lightly. They are packed in this way in flats when sent to the markets. Novices require to be told that the Broad-leaved Batavian is the best for winter use, the Green-curled not keeping so well.

Herbs.—Most herbs used in cooking are naturally best gathered fresh from the plants, and neat little bunches of all in season are generally included in the bi-weekly mixed hamper of vegetables. Some few kinds may be dried—cutting them before the flowers are far advanced,—bunched and hung up in dry, cool sheds for future use. Among these are Bush Basil, Sweet Basil, Sweet-knotted Marjoram, Mint, Sage, and Tarragon. Leaves and young shoots of Borage are used in the manufacture of claret cup; leaves of Chervil for flavouring salads; the young tops of Chives—which are constantly renewed by plants frequently cut over—as a substitute for young Onions in a salad; leaves and sprays of Fennel are principally required for cooking with certain kinds of fish; and the fresh tops of Mint make the best mint sauce. Parsley is simply indispensable for flavouring and garnishing all the year round, and sprigs of Thyme are wanted for flavouring generally.

Kale.—See BORECOLE.

Kohl Rabi.—In Germany and other Continental countries Kohl Rabi is largely grown either in preference to or as a substitute for Turnips, but with us it is not very popular. As a vegetable it is of no value when grown larger than a medium-sized Whitestone Turnip, and it is occasionally very acceptable at a time when hot weather has spoilt Turnips. Prepare, clean, store, or pack the roots as advised for Turnips.

Leeks.—Leeks grown in holes formed with a stout dibber are more easy to prepare for the

kitchen than are those that have been cultivated in trenches and duly soiled up to effect stem-blanching. Roots should be trimmed off, the tops considerably reduced, and each Leek be washed with the heart downward. They are perfectly hardy, and ought to be dug only as they are required. In the spring what remains of the crop may be lifted and heeled in on a north border, this prolonging their season. Leeks will stand rough treatment as regards packing. Those sent to the market are tied together in bundles.

Lettuces.—This salading, to be good, ought to be grown quickly, well-blanching hearts being required. Opinions vary as to the superiority of either Cos or Cabbage varieties, some connoisseurs preferring the solidity, crispness and sweetness of the former to the softer Cabbage sorts, which are apt to become quickly flabby in or out of salads. Lettuces ought not to be cut long before they are wanted for use, and any that have to be sent to a distance should not be exposed to winds and sunshine longer than is necessary. They keep fairly well for a few days if drawn from the soil and arranged with their roots in pans of water under cover of a cool shed. Late in the autumn those with hearts already formed may be lifted and replanted close together in frames, and, if protected from frost, will carry on the supply till midwinter.

The early Lettuces grown under glass, and more especially the Cabbage varieties of the early Paris Market type, are very tender and must be packed with more than ordinary care. Very few of the outer leaves should be removed, and those reserved ought to be made to enclose the hearts thoroughly, packing all on their sides closely in boxes, which in their return may be enclosed in the hamper of mixed vegetables. Those grown in the open may be packed closely in the topmost layer. For the market, house- and frame-grown Lettuces are packed in various kinds of baskets, the Cos varieties on their sides and the Cabbage varieties heart upwards.

Maize or Indian Corn.—During very hot summers Maize succeeds best with us, when the popular Peas often fail; the time may therefore yet come when it will be more generally cultivated as a vegetable than at present. Many who have grown Indian Corn failed to give it a second trial partly because of the common mistake of gathering and cooking the “cobs” before the grains had really developed, the soft young grains tasting like so much slightly-sweetened water. It is just as reasonable to

cook Peas when about one-third grown. The other extreme, or nearly ripe corn, should also be avoided, the fully-developed yet comparatively tender grains being tender, sweet, and juicy. The later supplies keep best on the plants, which may be lifted and stored out of reach of frost in the autumn. Pack the ears of corn just as they are gathered, as in this state they are enclosed in wrapper-like sheaths.

Mushrooms.—“Buttons”, or those not unfolded, are appreciated for some purposes, but the nearly or quite fully-developed Mushrooms known as “broilers” are more nutritious and richer in flavour. It often happens that some of each are attached to the large clusters of Mushrooms that have to be twisted out of the beds, and these are usually packed separately by those supplying the markets. Every care should be taken to keep the gills of the developed Mushrooms perfectly free of soil and grit. The stalks ought to be shortened only, cooks having a use for these as well as the tops.

Under no conditions do Mushrooms long retain their freshness, the gills quickly becoming soft and changing from pink to black. Small quantities may be packed in a shallow, paper-lined box, two layers deep and all stalks downwards, and if there are not enough to fill the box, fine wool-wool should be employed both above and below the Mushrooms, as loose packing may result in much injury to the contents of the box. Market-growers either pack in 1-pound punnets, these in their turn fitting tightly in boxes large enough to hold either six or one dozen punnets, or, in the case of heavy consignments, quarter-sieves and handled baskets are used. As before stated, they are well graded, while the baskets lined with paper are closely filled, all the Mushrooms being packed stalks downwards, not only to keep the gills clean, but also because they are less liable to break up than they would be with their stems upwards. The ends of the paper, purposely left over the sides of the baskets, are turned tightly over the Mushrooms, and stringing completes the process.

Mustard and Cress.—This small salading, to be at its best, must be grown quickly and in the dark till the stems are from 1 inch to 1½ inch high, as unless so grown up to within, say, two days of cutting, the stems are apt to be short and green, whereas they ought to be blanched and long. Both leaves and stems ought to be perfectly free of grit, rinsing not easily clearing produce not previously kept free

of soil. Mustard and Cress should be cut with a long sharp knife, and at once placed tops upwards tightly in punnets. If the punnets are to be enclosed in a hamper they ought to be well papered over, but they travel best as sent to the markets packed closely in boxes just deep and wide enough to hold either six or twelve punnets.

Onions.—For salad purposes only quite young Onions should be used, the white-skinned Tripoli or White Lisbon being the mildest and sweetest flavoured. Immense quantities of these, principally autumn sown, are grown for the markets, and these are duly bunched in the spring. White-skinned, fully-grown Onions are also the best for cooking as a vegetable. Very large roots of any variety of Onion are not commendable, cooks as a rule preferring medium-sized to small roots, and these are certainly the least wasteful. For storing, the white Spanish section is the best, these, if the roots are thoroughly well harvested, keeping well. The old-fashioned plan of stringing them up in bunches or ropes, and suspending these in a cool, dry room or shed, is still the best, Onions keeping admirably thus treated. Well-ripened Onions will stand somewhat rough treatment, and may be packed in the bottom of a mixed hamper; large quantities may be sent in sieves or bags.

Parsnips.—Very large roots of these are not desirable, as they cannot well be cooked without being cut up, whereas, to be really good and digestible, Parsnips ought to be cooked steadily until they are soft to the core, after which they may be duly quartered or otherwise prepared. They keep badly when out of the ground, becoming shrivelled and tough. Left where they are grown they can be dug as required, especially if the precaution is taken of covering part of the bed before it is frosted with straw-litter. In the spring what is left of the crop may be dug, and the roots stored in moist sand at the foot of a north wall or other cool situation. Small quantities are packed with other heavy roots in the bottom of a mixed hamper, and large quantities may be sent to the markets in bags or boxes.

Peas.—When to gather Peas ought to be decided by the wishes of those for whom they are intended. In some establishments they are preferred when about two-thirds grown, and most people like them fully grown but not in

the least degree old. Some varieties remain tender and sweet longer than others, and rapid maturation has also to be reckoned with in some seasons. If gathered before they are required for use they are liable to become somewhat tough, but where they have to be sent long distances to town-houses this cannot well be avoided. Shelling the Peas and packing them in paper bags economizes space, but they keep freshest when left in the pods. They may be packed loosely in one corner not far from the top of a mixed hamper, or in any position where the pressure is not likely to crush them. The earlier consignments to market are packed in half-sieves and sieves, and grassed over, with benders to keep all tight; when more plentiful, "pads" or two-bushel baskets with lids and bags are principally employed.

Potatoes.—Ashleaf Kidney and such sorts as Ringleader and May Queen may be lifted for use when the tubers are not more than half-grown, but in the majority of cases such very immature tubers are not fit to eat when cooked. Those responsible ought, therefore, to exercise a considerable amount of judgment in the matter of selections of varieties for early lifting, as in many establishments "new" Potatoes are wanted as early as they can be provided. When they are dug up they ought to be quickly moved into a dark place, exposure to the light and sun turning them green and greatly impairing their flavour. They ought not to require washing, but the later supplies may be washed, as they then present a better appearance. Those who are concerned about the cooking of Potatoes are advised to grade them for the kitchen, sending the larger tubers at one time and the smaller at another, or otherwise the cooking will be unequal, very few cooks taking the trouble to grade the tubers. Potatoes that have been allowed to sprout are of inferior quality as food. For that reason it is well to provide a cool, dark shed on the north side of a high wall for the storage of Potatoes, as in these places they can be watched more closely and turned oftener than when stored in earth and straw-covered heaps.

New Potatoes should be enclosed in Rhubarb leaves and placed in the middle of a mixed hamper of vegetables. Those sent to the market are variously packed in cross-handled, paper-lined baskets and quarter-sieves, and a little later barrels are principally used, the topmost tubers being covered with haulm or grass and kept down either by basket-lids or benders.

Main and late crop Potatoes travel at a cheaper rate if packed in bags. Hundredweight bags are principally employed by market-growers, and they are conveyed at ton rates.

Radishes.—Quickly-grown and pulled when quite young, Radishes are crisp, tender, and sweet, whereas, if grown slowly or left till they are old before drawing, they are tough, stringy, hot, and indigestible. Naturally they are best when first pulled, but if not unduly exposed they will keep good for several days. They should be bunched, have their tops, if somewhat bulky, trimmed, and the roots rinsed in clean water. They may be packed with other salad-ing, or, if for the market, in flats surrounded with grass.

Rhubarb.—The most pleasing in point of colour and the most delicately flavoured Rhubarb is that developed in heat in the dark. Thus produced it is brittle, and should be carefully handled. The leaves, if short, need not be interfered with, otherwise they may be reduced in size, but the blanched tops improve the appearance of Rhubarb. Tie up in bundles for the more convenient handling and packing. That raised in the open is harder and stands rougher handling. Market growers tie forced Rhubarb in small bundles of two to four sticks, not removing the leaves. Later rather larger bundles are made. It is packed closely in hampers or crates.

Salsify.—Roots of this vegetable do not keep well out of the ground, and the usual practice is to leave them where grown till they are wanted for use. In the spring, the ground being wanted for other vegetables, what is left of the crop may be lifted and laid in closely on a north border. When forked up the roots should be washed clean, and if to be packed, tied in small bundles to be placed in the hamper among other coarse vegetables.

Savoy Cabbages.—Too often these are grown to a great size and quite spoilt through having become coarse. Small hearts are the best. They are prepared and packed for private use or for sale much in the same way as ordinary Cabbages.

Scorzonera.—Treat precisely as directed for Salsify.

Sea Kale.—Sea Kale ought to be well

grown, in order to have strong crowns, as fine succulent growths cannot be forced out of weakly plants. To have it mild in flavour it must be forced in the dark. Too often Sea Kale is allowed to become long and comparatively old before it is cut. Left till the flower-stem develops, it becomes hard, and is practically spoilt. The shoots ought to be graded, if not by the grower certainly by the cook, and neatly tied into bundles. If not wanted for immediate use, stand the short length of stem connected with the growths in a pan of water in a cool dark shed. This is better than leaving the produce uncut. When packing, wrap each bundle in clean packing-paper and place in a box with other choice vegetables. Sea Kale for market ought always to be cut with an inch or more of stem attached, as this serves to keep the growth together and further tends to preserve its freshness. They should be tied up in compact bundles of a dozen growths or more. Not infrequently the lower half of the bundle is enclosed in blue paper, and packed tightly in deep punnets, which in their turn are packed in hampers or light boxes.

Spinach.—Large succulent leaves of Spinach are most desired, and failing these quite young plants or thinnings are sometimes substituted. If exposed after gathering Spinach quickly becomes flabby, but retains its freshness fairly well in a hamper, drawer, or box, in a cool place. New Zealand Spinach (*Tetragonia expansa*) is very different in its habit of growth, the young tops of much-spreading plants being boiled. The leaves of Perpetual or Spinach Beet more nearly resemble true Spinach in appearance, but they are not so good in quality. Strong roots continue to produce leaves in succession to those gathered, and Spinach Beet may be said to be a hardy and reliable, if not particularly good vegetable. When packing Spinach it may be mixed with other vegetables that require to be kept fresh, or it may be disposed in bulk near the top of the hamper. Spinach is marketed in hampers, crates, and bags.

Tomatoes.—Tomatoes are at their best when fully ripe. They may be well-coloured before this, but the flesh is comparatively hard and the pulp wanting in flavour; on the other hand, if kept till soft and flabby, all the brightness and much of the pleasing acidity is gone out of them. It is a mistake to imagine that

fruit that is slightly ribbed is necessarily inferior to that which is round and smooth. It is all a question of pulp, this being most plentiful in well-set fruit. Very solid fruit have too much core in them. The best-flavoured fruit are produced under glass, those ripening in June and July being excellent. When fully coloured, or a little earlier if the fruit is commencing to crack, it may be gathered, to be ripening in paper-lined boxes in a warm dry room rather than exposed on shelves to the roasting effects of direct sunshine and heat. The larger fruit should go to the kitchen, the salad-maker having the choice of medium-sized, well-ripened, red or yellow fruit. Tomatoes produced in the open air may be ripened in boxes as advised for house-grown fruit. Not a green fruit should be wasted, as these mixed with Onions, hot spices, and vinegar form a most admirable pickle.

Tomatoes, although not easily bruised, ought to be packed carefully. If sent in small quantities in boxes, they should be wrapped separately in soft paper and packed closely in soft wood-wool, not more than two layers going into a box. The fruit ought to be coloured but quite firm when packed, fully ripe fruit turning out, after a long journey, soft and flavourless. Market growers pack most of their Tomatoes in either cross-handled baskets, holding about twelve pounds of fruit, or in narrow-necked quarter-sieves. These are lined with packing-paper, with long ends overlapping the sides. No other packing-material is used, the fruit, well-coloured, firm and carefully graded, being packed closely in layers till within 1 inch of the rim, or the proper weight is put in, when the loose ends of paper are folded over the fruit and this kept down by stringing over. Few complaints of bad packing or rough handling are heard of. The baskets having handles, there is no excuse for rough handling, and further, the baskets not being full up to the rims, they can be stacked one above another safely enough in the luggage-vans of passenger trains. It is not found that the fruit travels any better in handled baskets with movable lids, the latter only adding to the expense and worries of both packers and buyers. The quality and weight of fruit contained is stated in or on each basket. The open-air Tomatoes, when produced in extra large quantities, are often sold by the bushel, and packed in flats and sieves much as Apples are.

Turnips.—Unless quickly grown Turnips

are liable to be hot and stringy, and they deteriorate rapidly in hot weather. This can be prevented for a few days by storing in a damp dark shed, but they are never so good as when newly drawn from the open ground, so that it behoves the cultivator to make frequent small sowings rather than rely upon fewer large sowings, the aim being to keep up a supply of roots rather smaller than a cricket-ball. Prior to packing, trim off coarse root-thongs, if any, and much of the foliage, and place them in the bottom of the hamper. For the markets the earlier Turnips are bunched, from twenty to twenty-five roots going to the bunch. When much more plentiful, this being in the autumn and winter, the roots are topped and tailed moderately hard, and consigned in bags, Potato-fashion.

In some localities Turnips are liable to be destroyed by frost, and in all such cases the precaution should be taken of storing at least a portion of the late sown or main crops. Early in November the roots ought to be pulled, their tops cut off closely, and stored in a heap, covering with straw and soil as advised for Potatoes. Early in the year the heap should be turned and all growing shoots removed.

Vegetable Marrow.—As a rule the fruit is left too long on the plants. Cut when about 6 inches long, cooked and served exactly as grown, there being no skin or seeds to reckon with, this excellent vegetable will be found more like Vegetable Marrow than is the case when large fruit are cut, pared, quartered, and boiled. This plan of early cutting also possesses the merit of favouring the production of a far greater continuous crop than is the case when the plants have to bear the strain of forming large fruit and maturing seeds. Vegetable Marrows keep fresh for several days stored with their foot-stalks in a pan of water placed in a cool dark shed. Quite young fruit ought to be packed similarly to Cucumbers, but the more fully grown fruit stand rougher treatment.

Market growers have to adapt their practices to meet the needs of their own particular districts or markets. In some towns very large Vegetable Marrows meet with most favour, in others the younger fruit is preferred. They are packed in flat pads and crates.

Water Cress.—The best produce is obtained from young plants in fresh soil over which 3 inches of clear water flows. The shoots should be cut over every week during the season, with a view to maintaining a supply of tender

salading. Tie in bunches, rinse in clear water before the leaves become dry, storing for two or three days if need be, in shallow pans of water and a cool place. For the market large bunches are formed and packed in hampers, the lids closing down tightly on the contents.

Hampers of Vegetables.—Large strong square hampers, duly shod, and strengthened by iron bands so formed as to be easily fastened down by means of a looped rod and padlock, are best for the carriage of vegetables. Ordinary oval-shaped, comparatively cheap hampers are neither convenient nor durable, and are dearest in the

end. Where not less than two hampers are despatched to a town-house by rail every week, a set of four hampers will be required, as there is often a delay in getting the empties back. The hamper should be so topped up with lighter vegetables that the lids when closed will hold the contents firmly. If not well filled when started, the shrinkage that inevitably occurs is bad for the contents. Heavy hampers of vegetables ought, where possible, to be sent by express goods train, as by ordinary goods train they are liable to be delivered a day too late, and the contents, especially in hot weather, may consequently be spoilt. [W. I.]

INDEX

NOTE.—The Roman Figures indicate the complete Volumes; *i.e.* i=Div.-Vols. 1, 2, 3; ii=Div.-Vols. 4, 5, 6.

ABBREVIATIONS.—cult. = culture; descript. = description; illust. = illustration; vars. = varieties.

A

Abelia—species, &c., descript. of, i, 286.
Abies—use of generic term, i, 327; 328; descript. of species, &c. (illust.), i, 328, 329.
Abraxas grossulariata—(illust.), descript. and treatment, i, 87.
Abutilon—calendarial directions, i, 18; descript. and cult. of species, &c., for greenhouse, i, 528; for summer bedding, i, 633; for subtropical garden, i, 642.
Acacia—calendarial directions, i, 8; rose and false acacias, descript. of, i, 318; greenhouse species, &c., descript., cult., and illust., i, 528, 529.
Acena—species, &c., descript., cult., and illust., i, 348.
Acalypha—calendarial directions, i, 2, 7, 10, 19; descript. and cult. as stove plants (illust.), i, 546.
Acantholimon—species, &c., descript. and cult., i, 348.
Acanthophoenix (Areca)—species, &c., descript. and cult., i, 609.
Acanthus—species, &c., descript. and cult., i, 348.
Accenter modularis—as garden friend, i, 117.
Acer—descript. and cult. of species, &c. (illust.), i, 286, 287; greenhouse plants, i, 529; forcing plants, i, 621.
Achillea—descript. and cult. of species, &c., i, 348; *A. umbellata* for carpet-bedding, i, 639.
Achimenes—calendarial directions, i, 7, 10, 12; descript., illust., and cult. of plants, i, 400.
Achrocline Saundersoni—for carpet-bedding, i, 639.
Acineta—species, &c., descript. and cult., i, 570.
Aconitum—species, &c., descript. and cult., i, 348.
Acorus Calamus and other species—descript. of, i, 384.
Acroclonium roseum—(illust.), descript. of, i, 388.
Acrophorus—(see Davallia).
Acrostichum—species, &c., descript. and illust., i, 586.
Actinidia polygama—descript. of, i, 287.
Ada—species, &c., descript. and cult., i, 570.
Adiantum—calendarial directions, i, 13; decorative ferns, i, 584; stove species, &c., descript. and illust., i, 586-588; hardy species, i, 604, 605.
Adonis—species, &c., descript., cult., and illust., i, 349; annual plants, i, 388.
Echmea—descript. and cult., i, 547.
Egle sepiaria—(illust.), descript. of, i, 287.
Aerides—species, &c., descript., cult., and illust., i, 570.
Eschynanthus—calendarial directions, i, 7; descript., cult., and illust., i, 547.
Esculus—species, &c., descript. and illust. of, i, 287.

Ethionema—species, &c., descript. and cult., i, 349.
Ethusa Cynapium—(illust.), descript. of, ii, 477.
Agapanthus—as greenhouse plants, descript. and cult., i, 529.
Agapetes—descript., cult., and illust., i, 529.
Agaricus campestris—(illust.), descript. of, ii, 463; cult. (see Mushroom).
Agathæa cœlestis—descript. and cult. of species, i, 529; *A. cœlestis variegata* for carpet-bedding, i, 639.
Agathosma—descript. and cult., i, 529.
Agave—descript., cult., and illust. of species, &c., i, 617; for carpet-bedding, i, 639; in subtropical garden, i, 641, 642.
Ageratum—calendarial directions, i, 3, 15; annual and summer bedding species, descript., cult., and illust., i, 388, 633.
Aglaiomorpha—(see Polypodium).
Agrotis exclamatonis, A. segetum—(illust.), descript. and treatment, i, 104.
Ailantus glandulosa—descript. of, i, 287.
Air—composition of atmospheric air, i, 43; air as a source of plant nutrition, i, 43; sterilizing process (the Lawton) for fruit-storage, ii, 384.
Ajuga reptans purpurea—descript. and cult. for spring bedding, i, 629; for carpet-bedding, i, 639.
Akebia quinata—descript. of, i, 287.
Albizia Julibrissin and A. lophantha—for subtropical garden, i, 642.
Albua—descript. and cult., i, 529.
Albumen—formation of, i, 53, 57.
Alder-trees—descript. of, i, 287.
Alexanders—descript. and uses, ii, 391; foreign names of, ii, 527.
Aleyrodes proleptella—descript. and treatment, i, 82.
Aleyrodes vaporariorum—descript. and treatment, i, 95.
Alisma natans, A. Plantago—descript. of, i, 384.
Allamanda—calendarial directions, i, 5, 9, 10, 16; descript. and cult. of, i, 547.
Allium—calendarial directions, i, 17, 18; directions for forcing *A. neapolitanum*, i, 625.
Allium ascalonicum—descript., uses, cult., and vars., ii, 516.
Allium Cepa—descript., origin, and history of cult., ii, 468; cult. (see Onions).
Allium Porrum—(illust.), descript. of, ii, 455; cult. (see Leeks).
Allium sativum—(illust.), descript., uses, and cult., ii, 444.
Allium Schönoprasum—descript., uses, and cult. of, ii, 438.
Allium Scorodoprasum—descript., uses, and cult., ii, 508.
Allosorus crispus—descript. and cult., i, 605.
Almond—
 Culture of fruit—descript., origin, and illust. of *Amygdalus communis*, ii, 251; gathering and storing fruit, list of vars., ii, 251, 252.

Almond (cont.)—
 Hardy ornamental species, &c., descript. of, i, 288.
Almond aphid—descript. and treatment, i, 79.
Alnus—species, &c., descript. and illust. of, i, 287, 288.
Alocasia—calendarial directions, i, 5; descript. and cult., i, 547.
Aloe—species, &c., descript. and cult., i, 617; American aloe (*Agave americana*), descript. and cult., i, 617, 642.
Alonsoa—annual species, &c., descript. of, i, 388; *A. incisifolia* in greenhouse, descript. and cult., i, 529.
Alpine auriculas—(see Auricula—Primula auricula).
Alpine Garden and Plants—
 Alpine plants—explanation of term, i, 343.
 Aspect best suited for, effect of sunshine on plants, &c., i, 346.
 Illusts.—rock-garden, i, 266; method of planting fissures and correct arrangement of stones in rockeries, i, 344, 345.
 Lists—rock plants suitable for English gardens, i, 347; select alpine plants, descript. and illust., i, 348-378.
 Planting—methods of, selection of suitable plants, i, 345.
 Raising alpine from seed or cuttings—management of cold frame, pots, &c., i, 346.
 Rockeries—formation of, position, soil, &c., suitable, i, 266, 267, 343-346.
Alpinia vittata—descript. and cult., i, 547.
Alsophila—descript. of species, &c., i, 588; plants for subtropical garden, i, 642.
Alstroemeria—species, &c., descript., illust., and cult., i, 349.
Alternanthera—calendarial directions, i, 15; carpet-bedding plants, descript. and cult., i, 639.
Althea rosea—(see Hollyhock).
Alyssum—calendarial directions, i, 14, 17; species, &c., descript. and cult., i, 349; *A. maritimum* as an annual and for summer bedding, i, 349, 389, 633; *A. saxatile* for spring bedding, i, 629.
Amaranthus—descript. and cult. of annual species, &c., i, 389; of plants for subtropical garden, i, 642.
Amaryliss—calendarial directions, i, 2; species, &c., descript. and cult.,—illust. of *Kew Belladonna*, i, 350.
Amasonia calycina (punicea)—calendarial directions, i, 13; descript. and cult., i, 547.
Amelanchier—species, &c., descript., cult., and illust., i, 287, 288; forcing *A. canadensis oblongifolia*, i, 622.
American aloe—descript. and cult., i, 617, 642.
American arbor-vitæ—descript. of, i, 334.
American blight—(illust.), descript. and treatment, i, 67, 68, 99.
American cowslip—descript. and cult., i, 357.

American crab-tree—descript. of, i, 315.
American Garden and Plants—
 American plants—explanation of term, i, 275, 285; lists of plants, i, 276, 286.
 Formation of garden—site, soil, &c., suitable, i, 275, 285.
American sweet fern—descript. of, i, 297.
Amherstia nobilis—descript. and cult., i, 547.
Ammonia—formation of, amount of in rain, i, 143; manurial uses of, i, 167, 168.
Ammoniacal solution of carbonate of copper—as a fungicide, i, 130; ii, 44.
Amorpha—species, &c., descript. of, i, 288.
Amorophallus campanulatus and other species—as stove plants, i, 547.
Ampelopsis—species, &c., descript. and cult., i, 288.
Amygdalus—classification of genus under Prunus, i, 288; hardy ornamental species, &c., descript. and cult., i, 288; *A. communis* (illust.), descript., origin, and cult., i, 251, 252.
Anæthochilus—descript. and cult. of orchids, i, 570.
Anagallis—annual species, descript. and cult., i, 389.
Ananassa sativa variegata—as a stove plant, i, 547.
Anbury disease—descript. and treatment, i, 129; effect of manure, i, 158, 164; cabbage attacked by (illust.), treatment of, ii, 477; turnips attacked by (illust.), ii, 521, 522.
Androcium—formation of, i, 51.
Andromeda—calendarial directions, i, 8; classification under various genera, i, 289; descript. and cult. of species, &c., i, 289.
Androsace—species, &c., descript. and cult., i, 350.
Anemia—species, &c., descript. of, i, 588.
Anemone—calendarial directions, i, 11, 13, 19; species, &c., descript. and cult., i, 350; popular garden sorts—descript., cult., and illust. of, i, 400, 401; forms for spring-bedding (illust.), i, 629.
Anemone disease—(illust.), treatment of, i, 126, 127.
Angelica—(illust.), descript., cult., and uses of, ii, 391; foreign names of, ii, 527; calendarial directions, ii, 538, 543, 549.
Angelica tree—descript. of, i, 289.
Angræcum—species, &c., descript. and cult., i, 570.
Anguloa—species, &c., descript. and cult., i, 570.
Anise—foreign names of, ii, 527; cult. of, ii, 540.
Aniseed—descript., cult., and uses of, ii, 391.
Annals, Hardy and Half-hardy—
 Annual—explanation of term as applied to plants, i, 387.
 General treatment—calendarial directions, i, 8, 10, 11, 14, 17; soil, &c., suitable, i, 387, 388; staking methods, i, 388; sowing the seed—time, method, and after-attention, i, 388.
 List of annuals—descript., cult., and illusts., i, 388-400.
 Reproduction process, i, 49.
Ansella—descript. and cult. of, i, 570.
Antennaria tomentosa—for carpet-bedding, i, 639.
Anthemis and vars.—descript. and cult., i, 350.
Anthemis nobilis—descript., uses, and cult. of, ii, 434.
Anthericum—species, &c., descript. and cult., i, 350.
Antheridia—(illust.), formation of, i, 64, 65.
Antherozoids—formation and functions of, i, 65.
Anthems—formation of, i, 30, 43, 51; emasculat. of, i, 60; pollination process (illust.), i, 53, 59, 60.
Anthomyia Betæ—descript. and treatment, i, 79.

Anthomyia Brassicæ—(illust.), descript. and treatment, i, 101.
Anthomyia ceparum—descript. and remedies, i, 108.
Anthomyia Lactucæ—descript. and treatment, i, 77.
Anthonomus pomorum—(illust.), descript. and treatment, i, 71.
Anthriscus Cerefolium—(illust.), descript., use, and cult., ii, 435.
Anthurium Scherzerianum and other species, &c.—as stove plants, i, 547.
Antirrhinum—calendarial directions, i, 13, 14, 16; popular garden forms—descript., illust., and cult., i, 401, 402; *A. majus* for summer-bedding, i, 633.
Ants—descript. and treatment, i, 74.
Aphelandra—descript. and cult. of, i, 547.
Aphis Amygdali—descript. and treatment, i, 79.
Aphis Brassicæ—descript. and treatment, i, 81.
Aphis brush—(illust.), descript. and use of, i, 196.
Aphis Dauci—descript. and treatment, i, 82.
Aphis Mali—descript. and treatment, i, 79.
Aphis Pruni—descript. and treatment, i, 89.
Aphis Rumicis—descript. and treatment, i, 80.
Aphrophora spumaria—(illust.), descript. and treatment, i, 95, 96.
Apis mellifica—as a garden friend, i, 115.
Apium graveolens—descript. and origin, ii, 429; cult. (see Celery).
Apium Petroselinum—descript., uses, and cult., ii, 477.
Aponogeton distachyon—(illust.), descript. and cult., i, 380, 381.
Apple aphid—descript. and treatment, i, 79.
Apple-blossom weevil—(illust.), descript. and treatment, i, 71.
Apple clear-wing moth—descript. and remedies, i, 112.
Apple mussel scale—(illust.), descript. and treatment, i, 68.
Apple sawfly—descript. and treatment, i, 74.
Apple-tree canker—(illust.), cause and treatment, i, 125; ii, 71, 72.
Apples and Apple-trees—
 Apple culture—preliminary remarks on, ii, 44-46.
 Calendarial directions, ii, 533, 539, 542, 548, 550, 554, 556.
 Commercial plantations—(see titles: Apples, &c., for Market; Orchards).
 Conditions affecting general culture, ii, 49.
 Disease and insect pests, cause and treatment—canker (illusts.), i, 125; ii, 71, 72; Codlin grub pest (illust.), i, 75, 76; mildew, ii, 72; scab disease, ii, 44; list of insects that attack apples, ii, 72.
 Evolution of the apple—origin, illust. of crab apple, and history of cultivated apples, ii, 46.
 Fertility and interpollination—influence of foreign pollen on formation of fruit, ii, 49.
 Flowering periods of various vars., ii, 48, 49.
 Frost-resisting qualities of the apple, ii, 44, 48.
 Gathering the crop—time and method, ii, 69.
 Grading and packing—value of good work, ii, 378; method of packing (illust.), ii, 378, 379; boxes for (illust.), and railway rates, ii, 79, 368-371; baskets and crates, ii, 372; barrels and bags, ii, 373, 374; packing materials, ii, 374.
 Improvement of the apple—systematic treatment and results of experiments, illusts. of Siberian and Hybrid crab apples, ii, 47, 48.
 Insect pests—(see sub-heading Disease and insect pests).
 Lists—explanation of arrangement, ii, 81, 82; descriptive list (illusts.) of select apples, ii, 82-93; lists of best vars. for special purposes, ii, 93-95; synonyms reference, ii, 95, 96.

Apples and Apple-trees (cont.)—
 Orchard house culture—planting, &c., ii, 275, 276; ripening of fruit, ii, 277; insect pests, ii, 278; list of vars. suitable, ii, 278.
 Orchard plantation and management—(see Orchards).
 Packing—(see sub-heading Grading and packing).
 Planting trees—age of trees for permanent planting, ii, 55; seasons to plant, ii, 56; distances, staking and general directions (illusts.), ii, 57-59; treatment of trees upon arrival and after planting, ii, 58, 60.
 Preserving apples—machines for paring and coring, &c. (illusts.), ii, 44, 45, 354, 355; vars. suitable and utilization of inferior crops, ii, 358; modes of preservation, ii, 358; pulp jam, ii, 347, 358; jelly, ii, 45, 349, 358; chutney, ii, 351, 359; crystallizing, &c., ii, 350, 359; drying or evaporating (see that title).
 Propagation—old methods, ii, 46; systematic improvement, results of, &c., ii, 47; effect of stocks, ii, 54; modern methods, directions for seed-raising, grafting, &c., ii, 70, 71.
 Pruning and training, directions and illusts.—standards, ii, 60-63; dwarf pyramids and bushes, ii, 63; dwarf bowl-shaped trees, ii, 63-65; cordons, ii, 65, 66, 68; espaliers, ii, 64, 66-68; wall-trees, ii, 68; root-pruning, ii, 68.
 Royal gardens, Windsor—illusts. of apple-trees in, ii, 48, 68.
 Selecting trees—forms (illusts.), character and merits of various trees, ii, 52-54; age of trees, ii, 55; treatment upon arrival, ii, 58; price of trees raised in nurseries, ii, 77.
 Situation—including altitude, aspect, climate, shelter, and rainfall, ii, 50, 51.
 Soil suitable for, ii, 27, 33, 51; results of analyses and effect of consolidation of the soil, ii, 51, 52; directions for preparation of soil, ii, 52; influence of grass land, ii, 38.
 Sterility of trees—cause and treatment, restoration of old trees, &c., ii, 39, 49, 68.
 Stocks and their effects—(illusts.), difference between root-systems of stocks, ii, 54, 55.
 Storing apples—use of, ii, 380, 386; time and method, ii, 69; arrest of decay, &c., and loss of weight caused by storage, ii, 381; trays (illust.) and preservative materials, ii, 69, 70, 382-384; temperature, ii, 384; vars. suitable, ii, 386; cold storage prices, ii, 388.
 Training—(see sub-heading Pruning and training).
Apples, &c., for Market—
 Advance of the industry—present position and prospects, ii, 45, 73, 74, 81.
 Disposal of surplus garden supplies, ii, 73.
 Establishment of a business—general directions and considerations, ii, 74, 75, 81; selection of district, ii, 74, 75.
 Expenses—purchase or rental of land, ii, 76; drainage, fencing, protection of trees, ii, 76; soil preparation and culture, ii, 76; road-making and keeping, ii, 77; purchase, planting and staking trees, ii, 77; tools and appliances, ii, 77, 80; storing, sorting, and packing rooms, ii, 77, 78; water supply, ii, 78; working expenses, market charges, &c., ii, 78-80.
 Land tenure—provisions for fruit plantations, ii, 75; purchase or rental of land, ii, 76.
 Planting trees—methods (illust.) and preparation of soil, ii, 34, 36, 37; merits of various methods, ii, 75.
 Prices and profits—conditions affecting market value of apples, importance of grading, &c.—average returns from a plantation, ii, 80, 81.
 Varieties suitable—qualities necessary, ii, 80, 81; lists of (see title Apples and Apple-trees).
 [See also Orchards.]

Apricot—

Calendarial directions, ii, 533, 536, 542, 544, 548, 550, 556.

Culture in open-air—

Planting trees—wall aspect, ii, 6, 8; border preparation, distances and forms of trees, time to plant and transplant, ii, 27, 195.

Protection of flowers and fruit, ii, 198, 199. Pruning and training—fan-training directions and illusts., ii, 195-197; management of shoots and spurs, ii, 196, 197; disbudding operation, ii, 197.

Soil and situation, ii, 27, 194, 195; general treatment of soil, manurial and water applications, ii, 198.

Thinning and ripening the fruit, ii, 197, 199.

Culture under glass—

Construction and management of house, border preparation, &c., ii, 199, 200.

Fertilization of flowers, thinning the fruit—processes of, ii, 199.

Pruning—time for, pinching the shoots &c., ii, 199.

Syringing, cleansing, and watering the trees, directions for, ii, 199, 200.

Varieties suitable, list of, ii, 202.

Description and history of the apricot, ii, 194.

Disease and insect pests, treatment of—mildew, ii, 198; insects in forcing house, ii, 199; list of insects, &c., ii, 200.

List of vars.—descript. and illusts., ii, 200-202.

Packing—methods of, ii, 377; boxes for, ii, 368, 371; packing materials, ii, 374.

Preserving—modes and vars. suitable, ii, 361; processes of jam-making, ii, 346, 361; crystallizing and glazing, ii, 350; drying, ii, 355, 356.

Propagation—methods of, use of mussel and plum stocks, ii, 194, 200.

Aquatic and Bog Plants—

Cultivation—selection and protection of plants, methods of planting, &c., i, 378-380.

Lists—descript. and illusts. of aquatic plants, i, 380-384; of marsh or bog plants, i, 384-387.

[See also Water garden—for particular plant, see its title.]

Aquilegia—calendarial directions, i, 5, 12; descript., cult., and illust. of species, &c., i, 350.

Arabis—calendarial directions, i, 6; species, &c., descript., and cult., i, 351; for spring bedding, i, 629.

Arable land—amounts of nitrogen and organic matter in, table showing, i, 150.

Arads—in subtropical garden, cult. of, i, 642.

Aralia—calendarial directions, i, 6, 12; descript., cult., and illust. of hardy species, i, 289; of greenhouse shrubs (illust.), i, 529, 530; of stove shrubs, i, 548.

Araucaria—hardy species *A. imbricata*, descript. and use for winter-bedding, i, 329, 646; greenhouse species, descript. and cult., i, 529; subtropical garden, species, &c., suitable for, i, 642.

Araujia—descript. and cult. of greenhouse plants, i, 529; of stove plants, i, 548.

Arbours—in pleasure-grounds, construction of, i, 276.

Arbutus—species, &c., descript. and cult., i, 289.

Archangelica officinalis—(illust.), descript., cult., and uses of, ii, 391.

Archegonia—(illust.), formation of, i, 64, 65.

Archontophoenix—descript. and cult., i, 609; *Scaevola elegans* for subtropical garden, i, 645.

Arctostaphylos alpinus—descript. of, i, 289.

Ardisia—calendarial directions, i, 6, 10, 12; descript. of *A. crenulata* as stove plant, i, 548.

Areca—calendarial directions, i, 2; *A. sapida* in subtropical garden, i, 642.

Arenaria—species, &c., descript. and cult., i, 351.

Arenga—descript. and cult., i, 609.

Argemone—species, &c., descript. and cult., i, 389.

Aristolochia—descript. and cult. of hardy species, &c., i, 289; of stove plants, i, 548.

Aristotelia Macqui and var.—descript. of, i, 289.

Armadilla vulgaris—(illust.), descript. and treatment, i, 99.

Armeria—species, &c., descript. and cult., i, 351.

Aroids—in subtropical garden, position for, i, 641.

Arpophyllum—species, &c., descript. and cult., i, 570.

Arrow Arum—descript. and cult. of, i, 383.

Arsenate of lead—as an insecticide, ii, 43.

Artemisia Abrotanum and var.—descript. of, i, 289.

Artemisia Absinthium (illust.), **A. pontica**, **A. maritima**—descript., uses, and cult., ii, 524, 525.

Artemisia Dracunculus—(illust.), descript., uses, and cult., ii, 518.

Artichoke—descript. and uses, ii, 391, in Italy, ii, 393; cultural requirements, treatment of suckers, seedlings (illust. of seed), &c., forwarding and protecting the crop, production of chards and *gobbo*, list (illusts.) of vars., ii, 392, 393; foreign names of, ii, 527; calendarial directions, ii, 532, 538, 540, 549, 555; packing, ii, 561. (See also Chinese, Jerusalem.)

Arum—species, descript. and cult., i, 351.

Arum lily—(see *Richardia*).

Arundina—species, &c., descript. and cult., i, 570.

Arundinaria—hardy species, &c., descript. of, i, 289, 290; illust. of *A. Simoni*, i, 284; aquatic and bog species, i, 381; greenhouse species, i, 530. (See also *Bambusa*.)

Arundo conspicua, **A. Donax**—descript. of, i, 385.

Arvicola arvalis, **A. riparia**—descript. and treatment, i, 104, 105.

Ash-tree and vars.—pruning, i, 255; descript. of, i, 302.

Asparagus—

Beds—preparation and planting (see sub-headings *Planting*, *Soil*).

Calendarial directions, ii, 532, 535, 538, 540, 543, 545, 555; forcing department, ii, 533, 536, 539, 556, 559.

Cutting the stems—time and mode, illust. of knife, ii, 399; effect of severe cutting, ii, 400.

Descript., origin, and history of cultivated asparagus, ii, 393, 394.

Duration of the plantation—effect of severe cutting, &c., ii, 400.

Forcing—descript. (illust.) of French mode, ii, 400; of old mode in protected trenches, by dung heat or hot-water-pipe heat, ii, 401, 402; system used at Frogmore, ii, 401; forcing removed plants, production of green asparagus, &c., in forcing-house, ii, 402.

Foreign names of, ii, 527.

French method of cult.—soil, &c., used, ii, 394; illusts. of planting and earthing-up, systems used, ii, 398, 399; for forcing (illust. of frames), ii, 400.

Insect pests, &c.—treatment of wire-worms, ii, 396; list of insect pests, ii, 402.

Manures—(see sub-heading *Soil and situation*).

Packing, ii, 561.

Planting—season for, width of beds and alleys, distances between rows and plants, ii, 396; directions for various ways of planting on raised beds or level ground, choice of plants, ii, 397; after-management, ii, 397, 398; duration of plantation, ii, 400; French method (see that sub-heading).

Asparagus (cont.)—

Propagation, ii, 394; production of seeds, ii, 400.

Seeds—propagation by, ii, 394; production and storing, ii, 400.

Soil and situation—preparation of the beds, application of manures, effect and composition of artificial manures, use of salt, &c., ii, 394-396; preparation of ground for plants grown in rows on the level, ii, 397; after-planting management, ii, 397, 398.

Treatment of plants after planting—seasonal directions, production of partially-blanced shoots, &c., ii, 397, 398.

Asparagus—greenhouse plants, descript., cult., and illust., i, 530; calendarial directions, i, 2, 6, 12, 18.

Asparagus beetle—(illust.), descript. and treatment, i, 79.

Asparagus knife—(illusts.), descript. and use of, i, 179, 181; ii, 399.

Asparagus officinalis—descript. and origin of, ii, 393; cult. (see *Asparagus*).

Asperula—descript. and cult. of perennial species, &c., i, 351; of *A. azurea setosa* as annual, i, 389.

Asphodeline—species, &c., descript. and cult., i, 351.

Aspidiotus Camelliae, **A. filicum**, **A. palmarum**—descript. and treatment, i, 92.

Aspidistra lurida—descript. and cult., i, 6, 548.

Aspidium—decorative ferns, i, 584; stove and greenhouse species, &c., descript. of, i, 588; hardy species, &c., descript. of, i, 605.

Asplenium—decorative ferns, i, 584; stove and greenhouse species, &c., descript. and illusts., i, 588-590; hardy species, &c., descript. and cult., i, 605; *A. Nidus* for subtropical garden, i, 643.

Assimilation of food of plants—i, 47. (See also *Nutrition*.)

Asters—calendarial directions, i, 8, 10; descript. and cult. of hardy perennial species, &c., i, 351; of annual (*China*, *German*, &c.) asters (illust.), i, 389, 390, 403; of popular garden species (illusts.), i, 402, 403; summer-bedding vars. (illusts.), i, 633, 634.

Astilbe—species, &c., descript. and cult., i, 351.

Astrantia—species, &c., descript. and cult., i, 351.

Astrocaryum—species, &c., descript. of, i, 609.

Ataccia cristata—(illust.), descript. and cult., i, 548.

Athalia spinarum—(illust.), descript. and treatment, i, 97.

Athous hæmorrhoidalis, **A. sputator**, **A. obscurus**—(illust.), descript. and remedies, i, 111.

Atmospheric drainage—necessity for in fruit-culture, ii, 33; Lawton process of sterilizing the air of fruit-storage, ii, 384.

Atrepex hortensis—(illust.), descript., uses, and cult., ii, 475, 476.

Attalea—species of, descript. and cult., i, 609, 610.

Aubergines—(see *Egg-plants*).

Aubrietia—species, &c., descript. and cult., i, 351; *A. deltoidea* for spring-bedding, i, 629.

Aucuba japonica—descript. and cult., i, 290; for winter-bedding, i, 646.

Auricula (*Primula auricula*)—calendarial directions, i, 5, 19; descript. and origin of, i, 371, 403, 404; cultivation and propagation, i, 404-406; Alpine vars.—division of, i, 404, treatment of, i, 406, list of, i, 407, spring-bedding vars., i, 629; show auriculas—descript. of, i, 404, list of vars., i, 406; insect pests, treatment of, i, 406; exhibition plants, conveyance of, i, 406.

Autogamy—process of pollination, i, 54; prevention of in hermaphrodital flowers, i, 59.

Axe—descript., illust., and use of cutting axe, i, 180; of pickaxe, grubbing axe, i, 173, 175.

Azaleas—

Calendarial directions, i, 2, 6, 9, 18.

Greenhouse species, *A. indica*—descript. and history, i, 150, 407; cult. and propagation, i, 151, 407-409; illusts. and list of vars., i, 407, 408, 409; insect pests, i, 409; soil (see that sub-heading).

Hardy species, &c.—descript. of (illust.), i, 290, 407. (See also sub-heading Popular garden plants.)

Popular garden plants—descript., origin, and history of Ghent, American, &c., azaleas, i, 495, 496; cultivation, propagation, use of for effect, i, 496, 497; vars. recommended, descript. and illusts., i, 495, 496.

Retarding growth of *A. mollis*, i, 628.

Soils suitable for cult. of *A. indica*—investigations by G. Truffant, composition of leaf-moulds from Ghent, &c., experiments at Versailles, i, 150-154; manurial applications, i, 154, 286.

Summer-bedding Ghent azaleas, i, 632.

Azara—species, &c., descript. of, i, 291.

Azolla filiculoides—descript. and cult., i, 381.

B

Babiana—descript. and cult., i, 530.

Baccharis halimifolia—descript. of, i, 291.

Bachelor's buttons—descript. and cult., i, 372.

Bacilli—descript. of, i, 30.

Backhousia myrtifolia—descript. and cult., i, 530.

Bacteria—descript. of, i, 30; influence on nutrition of plants, i, 43; action of and the production of nitrates in the soil, i, 134.

Balaninus nucum—descript. and treatment, i, 77.

Balanium—(see Dicksonia).

Balm—descript., cult., and uses of, i, 365, ii, 402; bastard balm, i, 365; foreign names of, ii, 527; calendarial directions, ii, 540, 550.

Balsams—calendarial directions, i, 8, 9, 12, 14; descript., cult., and illust. of, i, 392.

Bamboo stand—(illust.), for floral decorations, i, 653.

Bamboos—transplanting, i, 248; descript. and merits of hardy plants, i, 285; aquatic and bog plants, i, 381. (See also Arundinaria, Bambusa, Phyllostachys.)

Bambusa—hardy species, &c., descript. and cult., i, 291; aquatic and bog plants, i, 381. (See also Arundinaria, Phyllostachys.)

Banana—

Chinese Banana—(illust.), introduction into Europe and area of cultivation, ii, 310.

Construction of house for, ii, 310.

General treatment, soil, ventilation, &c., ii, 310; Kew system and vars. grown at Kew, ii, 309.

Origin and importance of banana as a food, extent of trade, &c., ii, 308, 309.

Banksia—descript. and cult., i, 530.

Barbarea præcox—descript., uses, and cult., ii, 440.

Barbe de capucin—cult. of chicory for (see Chicory).

Bark enemies—insect and other pests (illusts.), descript. and treatment, i, 67-71.

Barkeria—descript. and cult., i, 571.

Barley crops—effect of manures on, i, 144, 145.

Barometer—descript., illust., and management of, i, 21.

Barrows—(illusts.), descript. and use of watering barrows, i, 187; of wood and iron wheelbarrows, i, 188, 189; of fruit hand-barrows, i, 189.

Bartonia aurea—descript. and cult., i, 389.

Basil—(illust.), descript., cult., and use of basil and bush-basil, ii, 402, 403; foreign names of, ii, 527; calendarial directions, ii, 540, 543, 545; for forcing, ii, 536, 544.

Basket-plants suitable for conservatory, &c., i, 528.

Baskets—truck, descript. and illust. of, i, 189; orchid (illust.), i, 191; arrangement of cut flowers in (illust.), i, 654, 655; fruit, &c., conveyance (see title Packing).

Bast—formation of, i, 35, 37; use of bast tissue in plant-nutrition, i, 45.

Bastard balm—descript. and cult., i, 365.

Bastard indigo—descript. of, i, 288.

Batemannia—descript. and cult., i, 571.

Bats' guano—as a manure, i, 159.

Bean beetles—(illust.), descript. and treatment, i, 74.

Bean weevils—(illust.), descript. and treatment, i, 87, 88.

Beans—effect of manures on, i, 145; crops beans may follow and be succeeded by, ii, 390; seed quantities, ii, 397; descript., cult., gathering, saving seed, insect pests, and list (illust.) of vars., ii, 403-405; foreign names of, ii, 527; calendarial directions, ii, 532, 535, 538, 540, 543, 545, 555, 558; packing, ii, 562; haricot, French or kidney beans (see Kidney bean); scarlet-runner bean (see that title).

Beaumontia grandiflora—(illust.), descript. and cult., i, 548.

Bedding plants—soil suitable, i, 261. (See also titles: Spring-bedding, Summer-bedding, Carpet-bedding.)

Beech-tree and vars.—descript. of, i, 302; pruning, i, 253, 255.

Bees—removal of pollen by (illust.), i, 59; as garden friends, i, 115; assistance in interpollination of fruit, ii, 49.

Beet—crops beet may follow and be succeeded by, ii, 390; seed quantities, ii, 397; descript., cult., saving seed, forcing, insect pests, &c., and list (illusts.) of vars. of beet-root, ii, 405-407; leaf-beet (illust.), cult. and vars., ii, 406; foreign names of, ii, 527; calendarial directions, ii, 538, 540, 543, 545, 553; packing, ii, 562.

Beet carrion beetle—descript. and treatment, i, 79.

Beet fly—descript. and treatment, i, 79.

Beetles—(illusts.), descript. and treatment as plant enemies, i, 73, 74, 78, 79, 89, 103; as garden friends, i, 115, 116.

Begonia—calendarial directions, i, 4, 6, 7, 8, 9, 10, 11, 12, 13, 18; disease, i, 80; tuberous section—(illust.), descript., origin, and cult., i, 410, 411; miscellaneous species and hybrids—descript., cult., illusts., and lists of, i, 411-413; summer-bedding forms and propagation, i, 632-634.

Belladonna lily—calendarial directions, i, 14; descript., cult., and illust. of, i, 350.

Bell-glasses—(illust.), descript. and uses of, i, 196, 235.

Bellis perennis—for spring-bedding, descript. and cult., i, 629.

Berberidopsis corallina—(illust.), descript. and cult., i, 291.

Berberis—pruning methods, i, 256; species, &c., descript., cult., and illusts. of, i, 291-293; *B. vulgaris*, descript., origin, and cult. of, i, 293; ii, 273.

Berberry—descript. and illusts., i, 291-293; cult. of the fruit, ii, 273.

Berries—formation of fruit, i, 56.

Bertolonia—descript. and cult., i, 548.

Beta vulgaris and **B. Cicla**—(illust.), descript. and origin, ii, 405, 406; cult. (see Beet); *B. Cicla* variegata for subtropical garden, i, 643.

Betula—species, &c., descript., cult., and illust., i, 293.

Bignonia—hardy shrub, *B. capreolata*, descript. of, i, 293; stove species, descript. and cult., i, 548.

Bilberry—(illust.), descript. and cult., ii, 272, 273.

Billbergia—descript., cult., and illust., i, 548, 549.

Bill-hook—(illust.), descript. and use of, i, 179, 180.

Biota—winter-bedding forms, i, 646. (See also Thuja.)

Birch-trees—descript. of, i, 293.

Bird-cherry tree—descript. of, i, 295.

Birds—fruit and seed enemies, i, 75; protection of crops from, i, 75, ii, 207; garden friends, i, 116-118. (For special bird, see its name.)

Bird's foot violet—descript. and cult. of, i, 377.

Bird's-nest fern—(illust.), descript. and use of, i, 589, 590, 643.

Black aphid—descript. and treatment, i, 80.

Black rot—treatment of on tomatoes, ii, 341.

Black slug—descript. and treatment, i, 93.

Black stripe disease—treatment of on tomatoes, ii, 341.

Black vine weevil—(illust.), descript. and treatment, i, 80.

Blackberries—preserving modes and vars., ii, 363; cult., &c. (see Brambles).

Blackbird—as garden friend, i, 118.

Blackthorn or sloe tree—descript. of, i, 314.

Bladder-nut shrub—descript. of, i, 322.

Bladder senna—descript. of, i, 297.

Blaeberry—(see Bilberry).

Blanching pot—(illust.), descript. and use of, i, 191, 192.

Blandfordia—descript. and cult., i, 530.

Elastophaga grossorum—descript. and illust. of, ii, 213, 214.

Blatta americana, **B. orientalis**—descript. and treatment, i, 71.

Blechnum—species, &c., descript. of, i, 590; *B. brasiliense* for the subtropical garden, i, 643.

Elennocampa pusilla—descript. and treatment, i, 91.

Bletia—descript. and cult., i, 571.

Blight—(see American blight).

Blistered leaves—cause and treatment, ii, 179.

Blood—as a manure, i, 157.

Blood-root—descript. and cult. of, i, 372.

Blue cabbage flea—(illust.), descript. and treatment, i, 80.

Blue Marguerite—descript. and cult., i, 529.

Bluebells—descript. and cult., i, 373, 374; for spring-bedding, i, 631.

Blue-gum plants—for subtropical garden, i, 644.

Boat-house—for water-garden, construction of, i, 281.

Bocconia—species, &c., descript., cult., and illust., i, 351, 352; for subtropical garden, i, 643.

Bog Arum—descript. of, i, 381.

Bog Asphodel—descript. of, i, 386.

Bog-bean—descript. of, i, 381.

Bog-garden and plants—(see titles: Aquatic and Bog Plants, Water-garden).

Bog myrtle—descript. and cult. of, i, 386.

Boilers for Heating—

Advice on choice of, i, 217.

Construction (illusts.) and management of various makes—saddle boilers, i, 217, 218; tubular boilers, i, 219, 220; centrifugal boilers, i, 219; portable boilers, i, 220; small boilers for frames, &c., i, 220, 221.

Setting—materials used in, i, 221.

Bolea—descript. and cult., i, 571.

Boltonia—species, &c., descript. and cult., i, 352.
Bomarea—descript., cult., and illust., i, 530, 531.
Bombus terrestris, *B. lucorum*—as garden friends, i, 115.
Bone manures—formation and uses, i, 158.
Borage—foreign names of, ii, 527; calendarial directions, ii, 540, 543, 550.
Bordeaux mixture as an insecticide and fungicide—use and application of, i, 129, 130, ii, 43; for tomatoes, ii, 340; for potato disease, i, 130, ii, 499, 500.
Borecole—crops borecole may follow and be succeeded by, ii, 390; seed quantities, ii, 391; descript., cult., saving seed, insect pests, &c., and list (illusts.) of vars., ii, 407-409; foreign names of, ii, 527; calendarial directions, ii, 538, 540, 543, 545, 547, 550; packing, ii, 562.
Borning-rods—(illust.), descript. and use of, i, 182, 183.
Boronia—species, &c., descript. and cult., i, 530.
Bossia—species, &c., descript. and cult., i, 530.
Bottling whole fruit—process of, appliances for (illust.) and fruit suitable, ii, 351, 352.
Bougainvillea—descript. and cult., i, 548.
Bouquet-making—instructions for, illust. of stand, i, 649-651.
Bouvardia—calendarial directions, i, 2, 4, 9, 10, 12, 15, 17, 18; cult., illust., and list of best sorts, i, 413, 414; insect pests, i, 414.
Bowenia—species, &c., descript. and cult., i, 613, 614.
Bowling-greens—formation and care of, i, 279, 280.
Box—species, &c., descript. of, i, 293; winter-bedding forms, i, 646; use for edging walks, ii, 31.
Boxes—plant-boxes, illust. and use of, i, 192; for hot-bed (see Pits and Frames); fruit conveyance, &c. (see Packing).
Brachycoma iberidifolia—(illust.), descript. and cult., i, 389.
Brachysema—species, &c., descript. and cult., i, 530.
Bracken ferns—descript. of, i, 607.
Bracts—growth of, i, 48.
Brahea—species, &c., descript. and cult., i, 610.
Brambles—
 American blackberries—descript., illust., cult., and list of sorts, ii, 269, 270.
 Culture of brambles for fruit—merits and directions, ii, 268; list of vars. suitable, ii, 268, 269; illust. of bramble-rooting, ii, 268.
 Hardy ornamental species, &c.—descript., cult., and illust., i, 319, 320.
 Spineless blackberry grown at Kew, descript. and illust. of, ii, 269.
Branches—propagation by (see Layers).
Branching—(see Growth and Branching).
Brandy bottle—descript. of plant, i, 382.
Brasenia peltata—descript. of, i, 381.
Brassavola—descript. of orchids, i, 571.
Brassey onion-fly—(illust.), descript. and treatment, i, 99, 100.
Brassia—cult. and descript. of, i, 10, 571.
Brassica oleracea—descript. and origin of wild form and of garden races, ii, 414; cult. (see Cabbage).
Brassica oleracea acephala—descript., cult., and illusts., ii, 407, 408.
Brassica oleracea Botrytis—descript. and origin, ii, 425; cult. (see Cauliflower).
Brassica oleracea, var. *Botrytis*—descript. and origin, ii, 409; cult. (see Broccoli).
Brassica oleracea bullata—descript., cult., and list (illusts.) of vars., ii, 511.
Brassica oleracea caulo-rapa—(illust.), descript., uses, and cult., ii, 454.

Brassica oleracea gemmifera—descript. and origin, ii, 412; cult. (see Brussels-sprouts).
Brassica Rapa, *B. Napus*, and *B. campestris Rutabaga*—descript. of, ii, 520; cult. (see Turnip).
Brevoortia—species, &c., descript. and cult., i, 352.
Broad beans—(see Beans).
Broccoli—crops broccoli may follow and be succeeded by, ii, 390; seed quantities, ii, 391; descript., cult., protection in winter, cutting crop, saving seed, insects, &c., list (illusts.) of vars., ii, 409-412; foreign names of, ii, 527; calendarial directions, ii, 532, 538, 540, 543, 545, 547, 550; packing, ii, 562; cabbage broccoli (see Chou de Burghley).
Brodiaea—species, &c., descript. and cult., i, 352.
Bromelia Ananas—origin and cult., ii, 301.
Brook—ornamental uses of (see Stream).
Broom shrubs—pruning, i, 257; descript. and cult., i, 298, of Mount Etna broom, i, 303.
Brooms—descript. and uses of, i, 177.
Broughtonia—descript. and cult., i, 571.
Broussonetia papyrifera—descript. of, i, 293.
Browallia elata and other species—descript. and cult., i, 389; greenhouse plants, i, 531.
Brown tail moth—descript. and treatment, i, 81.
Brownea—descript. and cult., i, 548.
Bruchus granarius and *B. flavimanus*—(illusts.), descript. and treatment, i, 74.
Brunfelsia—descript. and cult., i, 548.
Brunsvigia—descript. and cult., i, 531.
Brush aphid—(illust.), descript. and use of, i, 196.
Brussels-sprouts—crops sprouts may follow and be succeeded by, ii, 390; seed quantities, ii, 391; descript., origin, cult., insects, &c., and list (illusts.) of vars., ii, 412-414; foreign names of, ii, 527; calendarial directions, ii, 535, 538, 543, 545, 547, 550; packing, ii, 563.
Bryanthus empetrifolius—(illust.), descript. of species and hybrid, i, 293.
Buckshorn Plantain—foreign names of vegetable, ii, 526.
Bud enemies—insect and other pests (illust.), descript. and treatment, i, 71-74.
Bud varieties or vegetative sports—appearance of, i, 55, 65.
Budding—disbudding process, ii, 175, 186, 197.
Budding, propagation by—explanation of operation, i, 47, 242; modes of budding, illusts. and directions, i, 243-245.
Budding knives—(illust.), descript. and use of, i, 178.
Buddleia—hardy species, &c., descript. and cult., i, 293; *B. Colvillei* and other species as greenhouse plants, i, 531.
Buds—primary, formation of, i, 34; growth and branching—formation of flower-buds, "winter" buds, &c., i, 46; illust. of buds on fronds and leaves, i, 47; inflorescence and bracts formation, i, 47, 48; adventitious buds, descript. of, i, 236; production of fruit, descript. of growth of leaf-buds (illusts.), ii, 169-171, 173.
Buffalo-berry shrub—descript. of, i, 320.
Bufo vulgaris—as garden friend, i, 119.
Buglosses—descript., cult., and illust., i, 534, 535.
Bulb mite—(illust.), descript. and treatment, i, 100.
Bulbophyllum—descript., cult., and illust., i, 571.
Bulbous plants—sclerotia disease (illust.), treatment of, i, 126, 127; list of plants for herbaceous border, i, 343. (See also Bulbs.)

Bulbs—calendarial directions, i, 2, 3, 4, 6, 10, 13, 16, 17, 18, 19; formation of (illust.), i, 36; propagation by, i, 227; forcing directions and sorts, i, 625-627.
Bullace—(see title Plums and Damsons).
Bulrush—descript. of, i, 384.
Buntins—as garden friends, i, 116.
Bupththalmum—species, &c., descript. and cult., i, 352.
Bupleurum fruticosum—descript. and cult., i, 293.
Burbidgea nitida—as stove plant, i, 549.
Burchellia capensis—as a stove plant, i, 549.
Burlingtonia orchids—descript. of, i, 581.
Burnet—foreign names of, ii, 527; calendarial directions, ii, 541.
Burning bush—(illust.), descript. of, i, 301, 357.
Butcher's broom—descript. and cult., i, 320.
Butomus umbellatus—descript. of, i, 381.
Buttercup, water—descript. of, i, 383.
Butterfly flowers—descript. and illust., i, 398.
Button-hole bouquets—directions for making and illust. of holders for, i, 651.
Buxus—species, &c., descript. and cult., i, 293; winter-bedding vars., i, 646; use of for edging walks in fruit-gardens, &c., ii, 31.
Byturus tomentosus—(illust.), descript. and treatment, i, 73.

C

Cabbage—
 Calendarial directions, ii, 532, 535, 538, 541, 545, 547, 550, 552, 553, 555.
 Crops cabbage may follow and be succeeded by, ii, 390.
 Descript. and origin of wild form and of garden races, ii, 414.
 Disease and insect pests, &c.—descript., cause, and preventive means of club-root (illust.), ii, 417; list of insects, &c., ii, 418.
 Foreign names of, ii, 527.
 List (illust.) of vars.—descript. and uses, ii, 418; red cabbage, ii, 418.
 Packing, ii, 563.
 Planting-out methods and general treatment of plants, ii, 416.
 Preserving—drying process, ii, 356.
 Propagation, ii, 416, 417.
 Savoy (see that title).
 Seed—quantities required for cropping, ii, 391; propagation by, means of saving seed, ii, 416, 417.
 Soil and manure for, ii, 414; treatment of seed-bed soil, &c., ii, 416.
 Sowings—time, method, and vars. for various sowings, coleworts and red cabbage sowings, additional sowings, ii, 414-416. (See also sub-heading Crops.)
Cabbage aphid—descript. and treatment, i, 81.
Cabbage broccoli—(see Chou de Burghley).
Cabbage butterflies—(illust.), descript. and treatment, i, 81.
Cabbage fly—(illust.), descript. and treatment, i, 101.
Cabbage gall weevil—(illust.), descript. and treatment, i, 101.
Cabbage moth—(illust.), descript. and treatment, i, 82.
Cabbage palms—descript. and cult., i, 610.
Cabbage powdered-wing fly—descript. and treatment, i, 82.
Cabomba aquatica—descript. and cult. of, i, 381.
Cacalia (Emilia) coccinea—descript. of, i, 389.
Cacti—(illust.), descript. and cult., lists of hardy cacti and best-known succulent plants, i, 616-621.

- Cæsalpinia japonica**—descript. of, i, 293.
- Caladium**—calendrical directions, i, 2, 4, 6, 10, 12, 13, 15, 18, 19; descript., cult., and illust. of species, &c., i, 414, 415; insect pests, i, 415; for subtropical garden, i, 641, 642.
- Calamintha**—species, &c., descript. and cult., i, 352.
- Calamus**—species, &c., descript. and cult., i, 610.
- Calandrinia**—descript. and cult. of perennial species, &c., i, 352; of annual species, i, 389.
- Calanthe**—calendrical directions, i, 2, 5, 10, 11, 16; descript. and cult. of, i, 571, 572.
- Calathea**—species, &c., descript. and cult., i, 549.
- Calceolaria**—calendrical directions, i, 3, 8, 9, 12, 14, 16, 17, 19; popular garden plants (illust.), origin and cult., i, 415, 416; other greenhouse species, i, 531; summer-bedding forms, i, 632, 633, 634; insect pests, i, 416.
- Calendar of Operations in Flower-garden and Pleasure-grounds**—Climate—table of mean temperatures of March, latitude Paris to Wick, i, 1. Flower-garden and pleasure-grounds, i, 3, 5, 6, 8, 9, 11, 12, 14, 16, 17, 19, 20. Pits and frames, i, 3, 5, 6, 8, 9, 11, 12, 14, 15, 17, 18, 20. Plant-houses, i, 2, 3, 5, 7, 8, 10, 11, 13, 14, 16, 17, 19.
- Calendar of Operations in the Fruit- and Kitchen-gardens**—Climate—table of mean temperatures of March, latitude Paris to Wick, ii, 531. Forcing department, ii, 533, 536, 539, 542, 544, 546, 548, 551, 552, 554, 556, 559. Hardy-fruit department, ii, 533, 536, 539, 542, 544, 546, 548, 550, 552, 554, 556, 558. Kitchen-garden department, ii, 531, 535, 538, 540, 543, 545, 547, 549, 552, 553, 555, 558. [For special fruit or vegetable, see its name.]
- Calendula officinalis** and other species—descript. and cult., i, 389; uses and cult. of *C. officinalis* as vegetable, ii, 462.
- Calico bush**—descript. of, i, 306.
- Californian nutmeg tree**—descript. of, i, 335.
- Californian pears**—cult. and export trade, ii, 96, 126, 131, 132, 134.
- Californian poppy**—descript. of, i, 397.
- Californian prune**—drying industry, vars. suitable for drying, i, 151, 153.
- Calla**—calendrical directions, i, 15, 18; descript. of *C. palustris*, i, 381.
- Callicarpa purpurea**—as a greenhouse shrub, i, 531.
- Callirhoe**—species, &c., descript. and cult., i, 352; annual species, &c., i, 389.
- Callistemon**—descript. and cult., i, 531.
- Callistephus chinensis**—(illusts.), descript. and cult., i, 389, 390; summer-bedding forms, i, 634.
- Calophaca wolgatica**—descript. of, i, 293.
- Caltha**—species, &c., descript. and cult., i, 352; *C. palustris* as a bog plant, i, 385.
- Calycanthus**—species, &c., descript. and cult., i, 293.
- Calystegia**—species, &c., descript. and cult., i, 352.
- Calyx of flower**—(illust.), formation and function of, i, 50.
- Camassia**—species, &c., descript. and cult., i, 352.
- Cambium**—formation of, i, 35, 36, 37.
- Camellia**—calendrical directions, i, 6; scale disease and insect pests, i, 92, 417; species, &c., descript. and cult., i, 293; popular garden forms (illust.), origin, cult., and list of vars., i, 416-418; wiring directions, i, 649.
- Campanula**—calendrical directions, i, 12, 13; descript. and cult. of hardy perennial species, &c. (illusts.), i, 352, 353; of annual forms, i, 390; of greenhouse forms, i, 531.
- Campanula Rapunculus**—(illust.), descript., uses, and cult., ii, 506, 507.
- Canarina campanulata**—as a greenhouse plant, i, 531.
- Candytuft**—descript. and cult., i, 362, 392.
- Canker**—in fruit trees (illusts.), cause and treatment, i, 125; ii, 71, 72, 128.
- Canna**—calendrical directions, i, 8, 17; popular forms—descript., origin, cult., and list of best vars., i, 418, 419; subtropical garden forms, i, 643.
- Cannabis sativus**—for subtropical garden, i, 643.
- Canning fruit**—extent of industry, ii, 344, 357; fruit suitable and directions for, ii, 357.
- Cantua**—descript., cult., and illust., i, 531, 532.
- Cape hyacinth**—(see *Lachenalia*).
- Cape ivy**—descript., cult., and illust., i, 542.
- Cape pondweed**—(illust.), descript. and cult., i, 380, 381.
- Capsicum**—ornamental plants, descript. and cult., i, 531; use and cult., &c., as vegetable, list (illust.) of vars., ii, 418, 419; foreign names of, ii, 527; calendrical directions, ii, 536, 539, 542, 543.
- Carabus violaceus**—(illust.), as a garden friend, i, 115.
- Caragana**—species, &c., descript. of, i, 293.
- Caraguata**—descript. and cult., i, 549.
- Caraway**—descript., uses of, cult., and illust., ii, 419, 420; foreign names of, ii, 527; calendrical directions, ii, 541.
- Cardamine**—species, &c., descript. and cult., i, 353; as bog plants, i, 385.
- Cardoon**—descript. and uses of common, Spanish, Tours (illust.), and Puyis cardoons, ii, 419, 421, 422; directions for cult. and cooking, ii, 420, 421; foreign names of, ii, 527; calendrical directions, ii, 532, 541, 543, 547, 550, 552, 553, 555; packing, ii, 563.
- Carduelis elegans**—as garden friend, i, 117.
- Carex**—descript. and cult. of hardy species, &c., i, 353; of greenhouse species, i, 531; of spring-bedding form, i, 629.
- Carnation and Picotee**—calendrical directions, i, 4, 5, 6, 8, 9, 11, 12, 14, 15, 20; soil, &c., i, 140, 420; insect pests, i, 112, 420; popular garden forms—descript., origin, cult., and list of vars., i, 419-421; perpetual-flowering and Marguerite types, i, 420; forcing, i, 625; summer-bedding, i, 632.
- Carnation maggot**—descript. and remedies, i, 112.
- Carolina Allspice**—descript. of, i, 293.
- Carpels**—formation of, i, 52.
- Carpet-bedding**—general directions, i, 637-639; illusts. of designs, i, 638, 639; list of plants suitable, i, 639, 640.
- Carpinus Betulus** and vars.—descript. of, i, 294.
- Carpocapsa funebrana**—(illust.), descript. and treatment, i, 78.
- Carpocapsa Pomonella**—(illust.), descript. and treatment, i, 75, 76.
- Carriage roads**—in pleasure grounds, formation of (illust.), i, 269, 271.
- Carrot**—preserving process, ii, 356; crops carrots may follow and be succeeded by, ii, 390; seed quantities, ii, 391; descript. and origin, ii, 422; general cult., ii, 422, 423; taking and storing the crop, saving seeds, ii, 423; forcing sorts and directions, insects, &c., ii, 424; list (illust.) of garden vars., ii, 424, 425; foreign names of, ii, 527; calendrical directions, ii, 532, 535, 538, 541, 543, 545, 547, 550, 554, for forcing, ii, 533, 536, 542; packing, ii, 563.
- Carrot aphid**—descript. and treatment, i, 82.
- Carrot blossom moth**—descript. and treatment, i, 71.
- Carrot fly**—(illust.), descript. and treatment, i, 102.
- Carrot-seed moth**—descript. and treatment, i, 75.
- Carum Carui**—descript., cult., and illust., ii, 419, 420.
- Carya**—species, &c., descript. and cult., i, 294.
- Caryota**—species, &c., descript. and cult., i, 610; subtropical garden species, i, 643.
- Cassandra calyculata** and vars.—descript. of, i, 294.
- Cassia**—calendrical directions, i, 9; descript. and cult. of species, &c., i, 531.
- Cassiope tetragona**—(illust.), descript. and cult., i, 294.
- Castanea sativa, C. dentata, and C. crenata**—descript., origin, and history of the chestnut, i, 294; ii, 252.
- Castanopsis chrysophylla**—descript. of, i, 294.
- Castor-oil plant**—descript. and cult., i, 397, 642, 645.
- Casuarina**—descript. and cult., i, 531.
- Catalpa bignonoides** and vars.—descript. of, i, 294.
- Catasetum**—descript. of, i, 572.
- Catch-cropping**—experiments regarding, ii, 38.
- Catchfly**—descript. and cult. of, i, 374, 398.
- Cattleya**—calendrical directions, i, 2, 3, 5, 7, 8, 10, 11, 13, 15, 16, 17, 19; hybridization, illust. of column bearing pollen masses, i, 62; house for, construction and management, i, 558, 561, 562; cultural requirements, i, 563, 565, 566; insect pests and disease, i, 102, 112, 158, 159; species, &c., descript. of, i, 572, 573; native habitats of, i, 557; illusts.—of species, i, 568, 571, 572, of potted cattleya, i, 563, of development of cattleya, i, 567.
- Cattleya fly**—descript. and treatment, i, 102, 112.
- Cauli**—(see *Oxalis crenata*).
- Caulicle**—(illust.), structure and functions of, i, 34, 35.
- Cauliflower**—Calendrical directions, ii, 532, 535, 538, 541, 543, 545, 547, 550, 552, 554, 555; for forcing, ii, 536, 539, 542, 556, 559. Crops preceding and following, ii, 390. Descript., origin, history of cult., and value of var. *Walcheren*, ii, 425. Diseases and insects (see under Cabbage). Forcing—French method in frames, ii, 426; directions and vars. suitable, ii, 426; in pots, ii, 427, 428. Foreign names of, ii, 527. List (illust.) of vars., ii, 428, 429. Packing, ii, 563. Preservation from frost, ii, 427. Preserving—drying process, ii, 356. Saving seeds, method of, ii, 428. Soil and manures, ii, 425. Sowings—seed quantities, ii, 391; climate conditions, ii, 425; time, method, and treatment—autumn sowings in open, wintered in frames, &c., in front of walls, ii, 425, 426; of winter and early spring sowings reared under glass, ii, 426; of late spring sowings in open border, ii, 427.
- Cavendishia**—species, descript. and cult., i, 532.
- Ceanothus**—calendrical directions, i, 3; species, &c., descript. and cult., i, 294; plants for forcing, i, 622.
- Cedar-trees**—descript. of species, &c., i, 329; of white cedar, i, 330; of prickly and pencil cedars, i, 330, 331.
- Cedrela sinensis**—descript. of, i, 294.
- Cedrus**—species, &c., descript. and cult., i, 329.
- Celastrus scandens, C. articulatus**—descript. of, i, 294.
- Celery**—Blanching—directions for trench and bed systems, ii, 431, 432; use of sea-sand, &c., French method of blanching, ii, 432; use of paper bandages, ii, 433.

Celery (cont.).—

Calendrical directions, ii, 532, 535, 538, 547, 543, 545, 548, 550, 554, 555, 558; for forcing, ii, 536, 539, 542.

Celcriac—(illust.), descript., uses, and cult. of, ii, 434; foreign names of, ii, 527; calendrical directions, ii, 538, 541, 545, 547, 550; packing, ii, 563.

Crops preceding and following, ii, 390.

Culture for exhibition—planting on raised beds, directions, ii, 432.

Culture in trenches or beds—preparation of ground, methods of planting, &c., ii, 430, 431; subsequent cult., ii, 431; earthing-up directions, ii, 431, 432.

Descript., origin, and uses of, ii, 429.

Disease and insect pests, ii, 433.

Foreign names of, ii, 527.

List (illust.) of vars., ii, 433.

Packing, ii, 563.

Preserving—drying process, ii, 356.

Protection in winter, ii, 433.

Saving seeds, method of, ii, 433.

Soil and manure, ii, 429; preparation of the ground—for trenches, ii, 430, for beds, ii, 431, for raised beds, ii, 432.

Sowings—seed quantities, ii, 391; various successional crops—time and methods of sowing, treatment of seedlings, ii, 429, 430; for supply in August, ii, 432.

Celery flies—(illusts.), descript. and treatment, i, 82, 83, 112.

Cell—structure (illusts.) and contents, i, 27–29; male and female, formation and functions, i, 30, 31, 48, 53, 60; cambium cells, i, 35, 37; epidermal, “guard” and palisade cells, formation of (illust.), i, 39, 40; embryo-sac formation, i, 53, 54.

Cellular plant—descript. of, i, 29.

Cellulose—formation of, i, 27.

Celmisia—species, descript. and cult., i, 532.

Celosia—calendrical directions, i, 9, 10, 12; species, &c., descript. and cult., i, 532; *C. pyramidalis* for summer-bedding, i, 634.

Celsia—calendrical directions, i, 11; descript. and cult. of species, i, 532.

Celtis—species, &c., descript. and cult., i, 294.

Cement for walks and borders—(see Concrete).

Cement tanks for water-gardens, &c., i, 378, 379.

Centaurea—descript. and cult. of perennial species, i, 353; of annual species, i, 390; of *C. ragusina* for summer-bedding, i, 634; of plants for subtropical garden, i, 643.

Centranthus—descript. and cult. of, i, 353.

Cephalaria—descript. and cult., i, 353.

Cephalotaxus—pruning, i, 256; species, &c., descript. and cult., i, 329.

Cerastium—species, &c., descript. and cult., i, 353; *C. tomentosum* for spring- and carpet-bedding, ii, 629, 639.

Cerasus—species, &c., descript. and cult., i, 294.

Cerataphis Latanæ—descript. and treatment, i, 92.

Ceratopteris thalictroides—descript. of fern, i, 590.

Ceratozamia—species of, descript. and cult., i, 614.

Cercis—species, &c., descript. and cult., i, 295.

Cereus—species, &c., descript. and cult., i, 617.

Ceroxylon niveum—descript. and cult. of, i, 610.

Certhia familiaris—as a garden friend, i, 119.

Cestrum—species, &c., descript. and cult., i, 532.

Cetonia aurata—(illust.), descript. and remedies, i, 109.

Ceuthorhynchus sulcicollis, *C. pleurostigma*—(illust.), descript. and treatment, i, 101.

Chain used in laying out ground lines—descript. of, i, 181, 182.

Chalk and chalk-marls—as manure, i, 165, 166.

Chalk soils—composition and cultivation of, i, 337; trees and shrubs best suited for, i, 283, 337, 338.

Chamædorea—species of, descript. and cult., i, 610; for subtropical garden, i, 643.

Chamæpeuce—for subtropical garden, descript. and cult., i, 643.

Chamæröps—species, &c., descript. and cult., i, 610; *C. Fortunei*, descript. and cult., i, 612, 643.

Chamomile—descript., uses and cult. of, ii, 434; foreign names of, ii, 527; calendrical directions, ii, 541.

Charcoal—as auxiliary to manure, i, 163.

Chaste-tree—descript. of, i, 395.

Chellanthus—species, &c., descript. of, i, 590.

Chematobia Brumata—(illust.), descript. and treatment, i, 98.

Cheiranthus—species, &c., descript. and cult., i, 353; *C. mutabilis* and hybrids as greenhouse plants, i, 532; *C. Cheiri* for spring-bedding, i, 631.

Chelone—calendrical directions, i, 11; species, &c., descript. and cult., i, 353.

Chenopodium Atriplicis—for the subtropical garden, i, 643.

Chenopodium Bonus Henricus—descript., uses, and cult., ii, 445.

Chenopodium Quinoa—(illust.), descript., uses, and cult., ii, 503, 504.

Cherry—Calendrical directions—outdoor, ii, 533, 539, 548, 550, 556; forcing, ii, 535, 537, 539, 543, 545, 547, 557, 559.

Culture out-of-doors—

Planting trees—methods, distances apart, &c., ii, 205; forms of trees (illusts.), ii, 204, 205, 206; forms yielding best crops, ii, 207.

Propagation—methods of, use of stocks, ii, 207.

Protection of fruit against birds, &c.—use of nets, ii, 207.

Pruning and training—standards, ii, 205; bush, cordon, and pyramidal, ii, 205; espaliers, ii, 205, 206; wall-trees, ii, 206; Morello cherry, ii, 206.

Soil and situation, wall aspect, &c., ii, 6, 8, 27, 204; manual applications, ii, 207.

Culture under glass—

General directions, ii, 208, 209; orchard-house treatment, ii, 275–277.

House suitable, construction and management, i, 207, ii, 208, 209; orchard-house, ii, 274.

Descript. of fruit and classification of vars., ii, 203.

Disease and insect pests—in forcing-house, ii, 208, 209; cause and treatment of gumming, leaf disease in Kent, &c., ii, 209, 210; insects that attack cherries, i, 83, ii, 210.

Lists of vars.—forcing for fruit in June to August, ii, 209; geans and griottes, ii, 211, 212; selections for various purposes, ii, 212; orchard-house vars., ii, 278.

Origin and history of cultivated cherries, ii, 202.

Packing—method of, ii, 378; boxes, &c., for, ii, 368, 371.

Preserving—modes and vars. suitable, ii, 203, 361; processes of crystallizing, &c., ii, 350, bottling, ii, 351, drying, ii, 354, 355, 356; Morello cherries for cherry brandy, ii, 203, 364.

Storage—shelves for stone fruits, ii, 383; cold-storage experiments, ii, 388.

Cherry aphid—descript. and treatment, i, 83.

Cherry-crab tree and vars.—descript. of, i, 315.

Cherry plum—as shelter trees, ii, 33, 76; descript. of, i, 314; cult. from seed, ii, 151.

Chervil and bulbous-rooted *Chervil*—(illusts.), descript., uses, and cult., ii, 435; foreign names of, ii, 527; calendrical directions, ii, 541, 543, 545, 550, 554.

Chestnut—

Culture for fruit—directions, propagation, list (illust.) of vars., ii, 252, 253; cult. in Italy, ii, 252; calendrical directions, ii, 533, 539.

Origin and history of European, North American, and Japanese chestnuts, ii, 252.

Preserving and storing the fruit, ii, 252, 253.

Species, &c., of trees—descript. of, ii, 287, 294; ornamental uses of, ii, 252.

Chicory—descript., illust., and uses of, ii, 435, 436; cult. for small salad, ii, 436; cult. for blanching—various modes, French methods, ii, 436, 437; saving seeds, lists of French and general (illust.) vars., ii, 437, 438; foreign names of, ii, 527; calendrical directions, ii, 541, 548, for forcing, ii, 533, 554, 559; packing, ii, 564.

Chili-peppers—(see Capsicum).

Chili saltpetre—manurial uses, i, 170.

Chimonanthus fragrans (illust.) and var.—descript. of, i, 295; for forcing, i, 622.

China aster—(illust.), descript. and cult., i, 389, 403.

Chinese arbor-vitæ—descript. of, i, 334.

Chinese artichokes—descript., illust., uses of, cooking and cult. directions, ii, 438; packing, ii, 561.

Chinese crab-tree—descript. of, i, 315.

Chinese primula—(see Primula).

Chionanthus retusus (illust.), *C. virginica*—descript. of, i, 295; for forcing, i, 622.

Chionodoxa—species, &c., descript., cult., and illust., i, 353, 354; *C. Lucilæ* for forcing, i, 625; spring-bedding species, descript. and illust., i, 629.

Chironia—descript. and cult., i, 532.

Chisels—descript. and use of, i, 181.

Chives—descript., uses, and cult. of, ii, 438; foreign names of, ii, 527; calendrical directions, ii, 554.

Chlorides in rain—source of, i, 143.

Chlorophyll—formation of (illust.), i, 29, 41, 43; use of in plant nutrition, i, 44.

Chlorophyll-producing plants—(see Green plants).

Chlorophytum—descript. and cult., i, 532.

Chlorosis—cause and treatment of “yellows” disease in fruit, ii, 179.

Cherophyllum bulbosum—(illust.), descript., use, and cult., ii, 435.

Choisya ternata—(illust.), descript. of, i, 295, 296; for forcing, i, 622.

Chokeberry shrub—descript. of, i, 314.

Chorizema—calendrical directions, i, 8, 11; descript., cult., and illust. of greenhouse shrubs, i, 532.

Chou de Burghley—origin, uses, and cult. of, ii, 438, 439.

Christmas rose—calendrical directions, i, 18; illust. and descript., i, 361; forcing directions, i, 625.

Christ's thorn—descript. of, i, 311.

Chrysalidocarpus (Areca) lutescens—descript. and cult. of, i, 610.

Chrysanthemum—

Cultural directions—calendrical, i, 3, 6, 9, 11, 15, 17, 18; general cult., propagation, &c., i, 421–423; housing the plants, i, 422; grafted plants, i, 423.

Cutting flowers for exhibition, i, 422.

History of the chrysanthemum—extent of cult., &c., i, 421.

Illusts.—annual form, i, 390; wild type, Japanese, reflexed, anemone, i, 422; pompon, incurved, Japanese reflexed, single, i, 424.

Insect pests and fungus disease—treatment of, i, 83, 424.

Chrysanthemum (cont.)—

- Lists—selections of various vars., i, 423, 424.
 Species, &c., descript. and cult.—perennials, i, 353, 354; annuals (illust.), i, 390.
 Summer-bedding vars. and directions, i, 634.
Chrysanthemum leaf miner—(illust.), descript. and treatment, i, 83.
Chrysocoma Coma-aurea—as a greenhouse plant, i, 532.
Chrysopa—(illust.), as garden friends, i, 121.
Chusan palm—descript., cult., and illust. of, i, 323, 324, 608, 612, 643.
Chutney—apple or tomato, process of making, ii, 351, 359.
Chysis—descript. of orchids, i, 573.
Cichorium Endivia—(illust.), descript., uses, and cult., ii, 442.
Cichorium Intybus—descript., illust., and uses of, ii, 435, 436; cult. (see Chicory).
Cicindela campestris, C. sylvatica—(illust.), as garden friends, i, 116.
Cider manufacture—revival of trade, ii, 45, 358.
Cimicifuga—species, &c., descript., cult., and illust., i, 354.
Cineraria—calendrical directions, i, 3, 4, 11, 12, 14, 15, 17; origin, history, and descript. (illust.) of greenhouse species, i, 424, 425, 542; cult., propagation, new strains, &c., i, 425; insect pests, i, 425, 426; C. maritima for summer-bedding, i, 634.
Cinquefoil—descript. and cult., i, 370.
Cirrhoptalum—descript. and illust., i, 573.
Cissus—calendrical directions, i, 6; descript. and cult., i, 549.
Cistus—descript. and cult. of hardy species, &c. (illust.), i, 295, 296; of greenhouse species, i, 532.
Citron—(see title Orange, Lemon, &c.).
Citrus—species, &c., descript. and cult., i, 532; cult. of oranges, lemons, &c., descript. and origin of genus, ii, 310; illust. of species, ii, 310, 311, 313, 314, 315.
Cladius pectinicornis, C. Padi—descript. and treatment, i, 91.
Cladosporium fulvum on tomatoes—treatment of, ii, 340.
Cladrastis—species, &c., descript. of, i, 296.
Clarkia—species, &c., descript. and cult., i, 390.
Clary—descript., uses, and cult. of, ii, 439; foreign names of, ii, 527; calendrical directions, ii, 541.
"Class"—botanical meaning of term, i, 66.
Classification of plants—explanation of botanical terms and methods, i, 65-67.
Clay—ashes of burned clay and clay-marls as manure, i, 163, 166.
Clay-coloured weevil—(illust.), descript. and treatment, i, 80, 83.
Clematis—calendrical directions, i, 8, 11, 15, 18; hardy ornamental species, i, 296; garden species—descript., origin, general and pot cult., i, 354, 426; illust. and lists of sorts, i, 426-428; greenhouse plant, i, 533; forcing directions, i, 622.
Clerodendron—calendrical directions, i, 10, 12; descript. and cult. of hardy species, i, 296; of stove species, &c., i, 549.
Clethra—descript. of hardy species, &c., i, 297; of C. arborea as a greenhouse plant, i, 533.
Cleyera japonica, var. variegata—as a greenhouse shrub, i, 533.
Clianthus—calendrical directions, i, 15; descript. and cult. of C. puniceus, i, 297; of greenhouse plants (illust.), i, 533.
Climate—tables of mean temperatures, latitude Paris to Wick, i, 1, ii, 531.
Climbing plants—for conservatory, list and illust., i, 528.
Clintonia (Downingia)—species, &c., descript. and cult., i, 390.

- Clislocampa neustria**—(illust.), descript. and treatment, i, 86.
Clivia—calendrical directions, i, 6; descript., illust., and cult. of species, &c., i, 428.
Cloches—(illust.), descript. and use of, i, 196, 235.
Club-mosses—descript. and illust., i, 603.
Club-root—(see Anbury disease).
Cnicus—species, &c., descript. and cult., i, 354.
Coal ashes—as manure, i, 163.
Coal-tar—use of on trees, i, 254.
Cobæa scandens—as greenhouse plant, i, 533.
Coccinella—(illust.), as garden friends, i, 116.
Cochlearia Armoracia—(illust.), descript., uses, and cult., ii, 446, 448.
Cochlioda—descript. of orchids, i, 573.
Cochlostema Jacobianum—as a stove plant, i, 549.
Cockchafer—descript. and treatment, i, 103.
Cockroaches—descript. and treatment, i, 71.
Coccol-nut palm—descript. and cult., i, 610.
Cocos—calendrical directions, i, 2, 12; species, &c., descript., cult., and illust. of, i, 610.
Codiaeum—(illust.), descript., origin, and cult., i, 429; insect pests, i, 430; list of vars., i, 430.
Codlin grub and moth—(illust.), descript. and treatment, i, 75, 76.
Coelogyne—calendrical directions, i, 7, 15, 18; species, &c., descript. and cult., i, 573.
"Cohort"—botanical meaning of term, i, 66.
Cohne nut palm—descript. of, i, 609.
Colchicum—species, &c., descript., cult., and illust., i, 354, 355.
Cold storage for preservation of fruit, &c.—use and prices in America, machinery used (illust.), and results of experiments in Britain, ii, 387, 388.
Coleus—calendrical directions, i, 13, 15, 19; garden forms—origin, cult., and illust. of, i, 430; insect pests, i, 431; greenhouse C. thysoides (illust.), i, 533; summer-bedding forms, i, 633, 634; carpet-bedding form, i, 639.
Colletia—descript. of species, i, 297.
Collinsia bicolor and other annual species—descript. and cult., i, 391.
Colocasia (Caladium) esculentum—for the subtropical garden, i, 643.
Colour schemes—flower-beds, i, 637, 638; cut flowers in vases, &c., i, 653.
Colourless plants—descript. of, i, 29, 30.
Columnæa scandens—as a stove plant, i, 549.
Colutea arborescens—descript. of, i, 297.
Combretum purpureum—as a stove plant, i, 549.
Commelina—species, &c., descript. and cult., i, 354.
Common flat-body moth—descript. and treatment, i, 84.
Compasses—descript. and use of ground compasses, i, 183.
Composts—as manure, formation and uses of, i, 162.
Comptonia asplenifolia—descript. of, i, 297.
Concrete paving—fruit-tree borders, directions and illust. for paving bottom of, ii, 26, 27; construction and cost of walks in kitchen-garden, ii, 31.
Conifers, Hardy—
 Chalky soil—suitability of conifers for, and list of specimens for planting in, i, 283, 337.
 Cultural requirements, soil, &c., suitable, i, 327; pruning, i, 253, 328.
 Description and nomenclature of conifers, i, 327; impetus given to cult., i, 327.
 Insect pests—treatment of, i, 328.

Conifers, Hardy (cont.)—

- Lists—species, &c., suitable for various purposes, i, 327, 328; descriptive list (illust.), i, 328-335; for chalky soils, i, 337.
 Shelter-belts—use of trees, ii, 10, 33.
Conservatory—(see title Greenhouses and Conservatories).
Convallaria—species, &c., descript. and cult. of, i, 354.
Convolvulus—species, &c., descript. and cult., i, 354; for summer-bedding, i, 634.
Copings—stone copings and coping-boards, construction of, i, 198, 199.
Copper carbonate—ammoniacal solution of as a fungicide, i, 130, ii, 44.
Coprolites—as manure, i, 166.
Cordylone—descript. and cult. of hardy species, i, 297; of garden groups as distinguished from Dracæna, &c., i, 437, 438; of greenhouse species, i, 533; of subtropical garden forms (illust.), i, 643.
Coreopsis—species, &c., descript. and cult., i, 355, 391.
Coriander—descript. and uses of annual as a vegetable, ii, 439; foreign names of, ii, 527.
Coriandrum sativum—(see Coriander).
Coriaria myrtifolia, C. japonica—descript. of, i, 297.
Corkscrew rush—descript. of, i, 386.
Corms—formation of (illust.), i, 36; propagation by, i, 227.
Corn-flower—descript. and cult. of, i, 390.
Corn salad—descript., uses, illust., and cult., ii, 439; foreign names of, ii, 527; calendrical directions, ii, 541, 550, 552, 554.
Cornelian cherry shrub—descript. of, i, 297.
Cornus—species, &c., descript. of, i, 297; winter-bedding plants, i, 647.
Corokia Cotonæaster—descript. of, i, 297.
Corolla of flowers—(illust.), formation of, i, 59, 51.
Coronilla—calendrical directions, i, 6; C. Emerus, descript. of, i, 297; species, &c., descript. of, i, 355; C. glauca as a greenhouse plant, i, 533.
Correa—species, &c., descript. and cult., i, 533.
Cortaderia (Gynerium)—descript. and illust., i, 385, 386.
Cortex—formation of, i, 33, 35.
Cortusa—species, &c., descript. and cult., i, 355.
Corvus frugilegus, C. monedula—as garden friends, i, 117.
Corydalis—species, &c., descript. and cult., i, 355.
Corylopsis—descript. of hardy shrub C. spicata, i, 297; plants for forcing, i, 622.
Corylus—species, &c., descript. and cult., i, 297; C. Avellana (illust.), descript., origin, and cult., ii, 254-257.
Cosmia pyralina—descript. and treatment, i, 86.
Cossignia borbonica—as a stove plant, i, 549.
Cossus ligniperda—(illust.), descript. and remedies, i, 113, 114.
Costmary—foreign names of vegetable, ii, 527.
Costus—species of, descript. and cult., i, 549.
Cotonæaster—species, &c., descript. and cult., i, 297, 298.
Cotton grass—descript. and cult. of, i, 385.
Cotton lavender shrub—descript. of, i, 320.
Cotton plants—descript. and cult., i, 551.
Cotyledon (Echeveria)—species, &c., descript., cult., and illust., i, 617, 618; carpet-bedding plants, i, 639.
Cotyledons—(illust.), structure and functions, i, 34, 35, 37, 38.

- Cow-dung**—as a manure, i, 161; nitrogen in and the cult. of mushrooms—analyses table, ii, 464.
- Cow-parsley**—descript. and cult., i, 361.
- Crab-apple tree**—(illusts.), and apple cult., ii, 46-48; stocks and their effects, ii, 54.
- Crab-trees**—American, cherry, Chinese, descript. of, i, 315.
- Crambe**—ornamental species, &c., descript. and cult., i, 355; *C. maritima* (illust.), descript. and uses, ii, 514, 515, cult. (see Sea-kale).
- Cranberry**—hardy ornamental species, descript. of, i, 310; cult. for fruit of common and American (illust.) cranberries, ii, 271, 272; bog plantation and clearance, ii, 272.
- Crane-flies**—(illust.), descript. and treatment, i, 103.
- Cranesbill**—descript. and cult., i, 360.
- Crassula**—calendarial directions, i, 8; species, &c., descript., cult., and illust., i, 617, 618.
- Cratægus**—hardy species, &c., descript., cult., and illust. of, i, 298; for forcing, i, 622; for winter-bedding, i, 647.
- Cream fruit shrub**—descript. and cult., i, 555.
- Creeping-Jenny**—for carpet-bedding, i, 639.
- Cress**—
American—descript., uses, and cult., ii, 440.
Calendarial directions, ii, 538, 543, 545, 547, 552, 554, 556; forcing, ii, 533, 534, 559.
Foreign names of, ii, 527.
Garden—descript., cult., and vars., ii, 440.
Nasturtium or Indian cress (see *Nasturtium*).
Packing, ii, 565.
Seed quantities for cropping, ii, 391.
Water—descript., uses, and cult. in water, shady borders, boxes, &c., ii, 440, 441; insect pests, ii, 441.
- Crinum**—descript. and cult. of hardy species, &c. (illust.), i, 355; of greenhouse plants, i, 533; of stove plants, i, 549.
- Crioceris Asparagi**—(illust.), descript. and treatment, i, 79.
- Crithmum maritimum**—(illust.), descript., uses, and cult., ii, 510.
- Crocasmia aurea**—for summer-bedding, i, 636.
- Crocus**—calendarial directions, i, 5, 7, 18; cult. and origin, i, 431; lists of species (illusts.) and of best Dutch or garden sorts, i, 431, 432; forcing, i, 625; spring-bedding, i, 630.
- Crops**—
Estimates of the yield and gain of carbon, and of the increased produce of carbohydrates, per acre per annum, in various crops, i, 144-146.
Fertility of soils—garden and field soils compared, i, 149.
Manures (see that title).
Sources of the nitrogen of crops (see Nitrogen).
Water supply, i, 149.
- Crosnes du Japon Spirals**—(see Chinese artichokes).
- Crossandra undulifolia**—as a stove plant, i, 549.
- Cross-fertilization and hybridization**—difference between, i, 55. (See also Fertilization.)
- Crotalaria**—descript. and cult., i, 533.
- Croton**—calendarial directions, i, 2, 5, 12, 15, 16. (See also *Codizum*.)
- Crowbar**—descript. and use of, i, 177.
- Crowberry shrub**—descript. of, i, 300.
- Crowea**—species of, descript. and cult., i, 534.
- Crows**—as garden friends, i, 117.
- Cryptomeria**—species, &c., descript., cult., and illust. of, i, 329; primordial leaves of *C. elegans*, retention of shape of, i, 327; winter-bedding form, i, 647.
- Crystallizing and glazing fruit**—process of, fruit suitable, ii, 350, 351.
- Cuckoo**—as a garden friend, i, 117.
- Cuculus canorus**—as garden friend, i, 117.
- Cucumber**—
Calendarial directions—outdoor, ii, 543, 545, 548, 552; forcing, ii, 534, 537, 539, 542, 546, 549, 551, 553, 554, 557, 559.
Conditions necessary for successful cult., ii, 322.
Culture in frames—
Construction of frame, ii, 323.
Fruiting-bed—formation of, management of temperature, &c., ii, 324.
Pruning and training—stopping plants at every stage of growth, ii, 323; general directions, ii, 324, 325; treatment of crooked fruit, ii, 325.
Seed-bed—soil and manure, ii, 322, 323; formation, situation, temperature, and protection of bed, ii, 323, 324; proving and sowing the seeds, treatment of seed-pots and plants, ii, 323.
Watering, ventilation, coverings, and shading, ii, 324.
Culture in glass-house—
Advantages of, ii, 325.
Construction and management of house, trellises, and pipes for heating purposes, ii, 326; temperatures, ii, 326, 327.
General directions—raising the plants, manures, pruning, &c., ii, 326, 327.
Winter culture, ii, 323; general directions, ii, 327; temperature, ventilation, and soil suitable, ii, 328.
Culture in open-air on ridges, &c.—advantages of, ii, 322; directions, ii, 328; cult. in open fields, methods and profits, ii, 328; vars. for, ii, 330.
Foreign names of, ii, 527.
Gherkins for pickling, cult. of, ii, 329.
Insect pests—treatment of, ii, 326, 327; list of insects that attack cucumbers, ii, 329.
List and classification of vars.—result of cultural trial at Chiswick, &c., ii, 329; descript. and illusts. of vars., ii, 329, 330.
Origin and history of culture in Egypt and Italy, &c., ii, 322.
Packing methods, ii, 380, 564.
Ridge cucumbers (see sub-heading Culture in open-air).
Seed production, means of saving seed—trade-grower's methods, &c., ii, 328.
- Cucumber tree**—descript. of, i, 308.
- Cucumis Melo**—descript., origin, and cult., ii, 316.
- Cucurbita Maxima, C. Moschata**—origin and cult. of gourds, ii, 445.
- Cucurbita Pepo**—descript. and cult., ii, 445, 522.
- Cunninghamia sinensis**—descript. of, i, 329.
- Cupania filicifolia**—as a stove plant, i, 549.
- Cuphea platycentra**—for summer bedding, i, 634.
- Cupressus**—hardy species, &c., descript. and illusts., i, 330; *C. funebris* for greenhouse, i, 534; winter-bedding forms, i, 647.
- Curculigo recurvata**—calendarial directions, i, 6; descript. and cult. of *C. recurvata variegata*, i, 549.
- Curcuma Roscoeana**—as a stove plant, i, 549.
- Curl disease**—descript. and treatment of on potatoes, ii, 498.
- Current aphid**—(illust.), descript. and treatment, i, 84.
- Current clear-wing moth**—(illust.), descript. and remedies, i, 113.
- Current gall mite**—(illust.), descript. and treatment, i, 72.
- Current sawfly**—(illust.), descript. and treatment, i, 85, 86.
- Current-shoot moth**—(illust.), descript. and remedies, i, 113.
- Currants**—
Calendarial directions, ii, 533, 550, 554, 556, 558.
Descript. and origin of sorts, merits of fruit for cultivation, ii, 229.
Disease, bud—illust. and treatment, i, 72.
Gathering the fruit—time for, ii, 231.
Insect pests—list of, ii, 232. (See also names of insects.)
List of vars.—descript. and illusts., ii, 232, 233; fruit for preserving, ii, 363, 364.
Packing—boxes and crates (illust.) for, ii, 368, 373.
Planting—orchard plans (illusts.), ii, 37, time and methods, soil and situation, ii, 229, 231.
Preserving—modes and vars. suitable, ii, 229, 363, 364; processes of jam-making, ii, 346, jelly-making, ii, 349, bottling, ii, 351, fruit juices, &c., ii, 358, 364.
Propagation—methods of, management of cuttings, ii, 231.
Pruning and training—(illusts.), general directions, ii, 229, 230; standards, ii, 230; wall-trees, espaliers, and cordons, ii, 231.
Storage—shelves for, ii, 383; ordinary method, ii, 387; cold storage, ii, 388.
- Curruca atricapilla, C. hortensis, C. cinerea**—as garden friends, i, 118.
- Cutting instruments**—descript. and illusts., i, 178-181.
- Cuttings, propagation by**—detached buds, i, 46; descript., selection, and preparation of cuttings, i, 124, 231, 232; time for taking off cuttings, i, 232; materials in which cuttings are struck, i, 233; insertion, i, 233; temperature, moisture, and light, i, 234, 235; use of bell-glasses, i, 235.
- Cyanophyllum magnificum**—as a stove plant, i, 549.
- Cyathea**—species, &c., descript. of, i, 591; *C. dealbata* for subtropical garden, i, 643.
- Cycads**—scale insects on, i, 92; decorative uses of, i, 527, 613; illust. of cycads at Kew, i, 608; illust. of cones, i, 613; descript., history, and cult., i, 613, 614; list of species (illusts.), i, 614, 615.
- Cycas**—characteristics of, i, 613, 614; illust. of cones, i, 613; descript., cult., and illusts. of species, i, 614, 615; *C. revoluta* as subtropical garden plant, i, 643.
- Cyclamen**—calendarial directions, i, 4, 11, 12, 16, 17, 18; hardy species, &c., descript. and cult., i, 355; popular garden forms—(illust.), descript., origin, and cult., i, 432, 433; insect pests, i, 432.
- Cynoches**—descript. and cult., i, 573.
- Cydonia**—species cultivated under name of Quince, descript. and illusts., ii, 259, 260. (See also *Pyrus*.)
- Cymbidium**—calendarial directions, i, 15; descript. of species, &c., i, 573.
- Cynara**—ornamental species, &c., descript. and cult., i, 355; *C. Cardunculus* as vegetable—descript. and origin, ii, 419, cult. (see Cardoon); *C. Scolymus* as vegetable—descript., cult., illusts., and uses of, ii, 391-393.
- Cyperorchis**—descript. of orchids, i, 573.
- Cyperus**—calendarial directions, i, 2, 6, 12; descript. and use of aquatic and bog plants, i, 381, 385.
- Cyphomandra**—species, &c., descript., cult., and illust. of, i, 534.
- Cyripedium**—calendarial directions, i, 5, 7, 10, 15, 18; hybridization, removal of pollen masses, i, 62; descript., illusts., and cult. of hardy species, i, 356, of bog plants, i, 386, 387, of orchid-house species, &c., i, 573, 574.
- Cytomium**—(see *Aspidium*).
- Cystopteris**—species, &c., descript. and cult., i, 605.
- Cytisus**—hardy species, &c., descript. and cult., i, 298; greenhouse species (*Genista*), i, 534; forcing plants and directions, i, 622.

D

Daboëcia polifolia—descript. of, i, 298.

Dactylis glomerata variegata—for summer-bedding and carpet-bedding, i, 634, 639.

Dactylopius adonidum—descript. and treatment, i, 68.

Dactylopius destructor, D. longifilis—descript. and treatment, i, 92.

Daddy long-legs—(illust.), descript. and treatment, i, 103.

Dæmonorops—descript. and cult., i, 610.

Daffodil—(see *Narcissus*).

Dahlia—calendarial directions, i, 8, 11, 13, 17; hardy species, descript. and cult., i, 356; popular garden forms—origin and descript. (illusts.) of single, cactus, pompon, &c., dahlias, i, 433, 434, cult., propagation, soil, &c., i, 434, 435; insect pests, i, 435; lists of sorts, i, 436; climbing dahlia for greenhouse, i, 536; summer-bedding vars., i, 634.

Daisies—destruction of on lawns, i, 279; Swan River daisy, descript. and cult., i, 389; spring-bedding forms and directions, i, 5, 629; Michaelmas daisies (see that title).

Daisy-rake—(illust.), descript. and use of, i, 174.

Dalechampia Roeziana—as a stove plant, i, 549.

Damsons—(see title *Plums and Damsons*).

Dandelion—uses and cult. of, ii, 441; foreign names of, ii, 527.

Daphne—calendarial directions, i, 18; hardy species, &c., descript., cult., and illust. of, i, 299; greenhouse shrubs, i, 534; forcing sorts and directions, i, 622.

Daphniphyllum—species of, descript. and cult., i, 299.

Dart moths—(illust.), descript. and treatment, i, 104.

Darwinia (Genetyllis and Hederona)—descript. and cult., i, 534.

Dasylirion—descript. and cult., i, 534.

Date palm—descript. and cult. in sub-tropical garden, i, 645.

Date plum—descript. and cult. of hardy species, i, 299, ii, 264, of greenhouse species (illusts.), i, 534, ii, 263; fruit culture—directions, propagation, pruning, &c., ii, 263, 264; Japanese cult. of, list of vars., ii, 263-265.

Datura (Brugmansia)—descript. and cult. as greenhouse plants (illust.), i, 534; for sub-tropical garden, i, 643.

Daucus Carota—descript. and origin of wild and cultivated carrots, ii, 422; cult. (see *Carrot*).

Davallia—species, &c., descript. and illust., i, 591-593.

Day-lily—(illust.), descript. and cult. of, i, 361.

Deciduous or Bald cypress tree—descript. of, i, 333.

Decorative plants—for house and table, i, 6, 12.

Decumaria sarmentosa—descript. of, i, 299.

Delphinium—calendarial directions, i, 12; descript., origin, and cult. of perennial species, &c. (illust.), i, 356, of annual sections, i, 391, of popular garden forms (illust.), i, 437.

Dendrobium—calendarial directions, i, 2, 3, 5, 7, 9, 10, 11, 13, 14, 16, 18; native habitats of, i, 558; cultural requirements, i, 561, 565, 566, 567, 568, 569; species, &c., descript. and illusts., i, 574, 575.

Deodar tree—descript. of, i, 329.

Deparia Moorei—descript. of, i, 593.

Depressaria applanata—descript. and treatment, i, 84.

Depressaria depressella—descript. and treatment, i, 75.

Depressaria Pastinacella—descript. and treatment, i, 71.

Desfontainea spinosa—descript. of, i, 299; as a greenhouse plant, i, 534.

Desmodium gyrans—as a stove plant, i, 549.

Deutzia—calendarial directions, i, 3, 11, 18; hardy species, &c., descript. and cult., i, 299; forcing directions and species (illust.), i, 622.

Devil-in-the-bush—descript. of, i, 396.

Devil's coach-horse—(illust.), descript. of insect, i, 115.

Dew and Hoar-frost—table showing amounts of certain constituents found in, i, 143.

Diamond-back moth—(illust.), descript. and treatment, i, 84.

Dianthus—calendarial directions, i, 16; descript., cult., and illusts. of hardy perennial species, &c., i, 356, of hardy annual species, &c., i, 391; *D. Caryophyllus* and popular garden plants (see *Carnation and Picotee*).

Diaspis ostreaformis—(illust.), descript. and treatment, i, 69.

Dibbers—(illust.), descript. and use of, i, 175, 176; potato-dibber, i, 177.

Dibbling as a mode of transplanting small plants, i, 177.

Dicentra—species, &c., descript. and cult., i, 356.

Dichorisandra musaica—descript. and cult., i, 549.

Dicksonia—stove and greenhouse species, &c., illust. and descript. of, i, 592, 593; hardy fern *D. punctilobula*, descript. of, i, 605; cult. of *D. antarctica* in sub-tropical garden, i, 643.

Dicotyledons—descript. of, i, 37, 39.

Dictamnus Fraxinella (illust.) and vars.—descript. and cult., i, 357.

Dictyosperma—descript. and cult., i, 610.

Didymochlæna lunulata—descript. of, i, 593.

Dieffenbachia—descript. and cult., i, 549.

Dielytra—calendarial directions, i, 18; forcing directions, i, 625.

Diervilla (including *Weigela*)—species, &c., descript. of, i, 299; forcing forms and directions, i, 622.

Digitalis—species, &c., descript. and cult., i, 357.

Dill—foreign names of, ii, 527; calendarial directions, ii, 541.

Dillwynia—species, &c., descript. and cult., i, 534.

Diloba cæruleocephala—(illust.), descript. and treatment, i, 85.

Dinner-table floral decorations—directions and illusts., i, 652-655; arrangement of fruit, i, 654.

Dioon—cones of (illust.), i, 613; species of, descript., i, 615.

Diosma ericoides—as a greenhouse shrub, i, 534.

Diospyrus—species, &c., descript. of, i, 299, ii, 264; *D. Kaki* (illust.), descript. and cult., i, 534, ii, 263-265.

Dipladenia—calendarial directions, i, 4, 9, 10; descript., cult., and illust., i, 549, 550.

Diplazium—(see *Asplenium*).

Diplothemium—descript. and cult. of palm *Ceroxylon niveum*, &c., i, 610.

Disa—species, &c., descript., cult., and illust. of, i, 575.

Diseases of plants caused by fungi—(see *Fungi*).

Ditula angustiorana—(illust.), descript. and treatment, i, 76.

"Division"—botanical meaning of term, i, 66.

Division—propagation by, i, 227.

Dock-weeder—descript. and use of, i, 177.

Dodecatheon Meadia and forms of—descript. and cult., i, 357.

Dog's-tooth violet—descript. and cult., i, 358.

Dogwood—descript. of, i, 297; for winter bedding, i, 647.

Doodia—species, &c., descript. of, i, 593.

Doronicum—species, &c., descript. and cult., i, 357; spring-bedding, i, 630.

Doryanthes excelsa and D. Palmeri—as greenhouse plants, i, 534.

Doryopteris—(see *Pteris*).

Double rocket—descript. and cult., i, 362.

Draba—species, &c., descript. and cult., i, 357.

Dracæna—calendarial directions, i, 5, 7, 12, 15; descript., origin, cult., and list (illusts.) of popular garden groups, i, 437, 438; insect pests, i, 438; decorative uses of, i, 527; sub-tropical garden form (illust.), i, 642, 643.

Dracocephalum—species, &c., descript. and cult., i, 357.

Drag—(illust.), descript. and use of, i, 174.

Drainage—
Atmospheric—necessity of for successful fruit-culture, ii, 33; Lawton process of sterilizing air in fruit-room, ii, 384.
Beneficial effects of—main art and use of drainage, ii, 25.
Covered drains—formation of various kinds of stone-drains (illust.), ii, 21, 22; tile-drains (illust.)—kinds of, and methods of bedding, ii, 22, 23; pipe-drains (illust.), descript. and method of cutting trenches for, ii, 23; use of drain-pipe collars (illust.), ii, 23; size of drain-pipes, ii, 23.
Flower-gardens, i, 260, 261.
Fruit and kitchen-gardens, ii, 17.
Borders for fruit-trees, ii, 26.
Cutting—direction of drains, instructions for operation of cutting drains, i, 24, 25.
Ground requiring no artificial drainage (illusts.), ii, 17, 18.
Length and depth of drains, question of, ii, 23, 24.
Main drains, various modes of forming—directions and illusts., i, 23, 24.
Open drains, descript. and illust. of system used for, ii, 21.
Strata (illust.), various arrangement of and the passage of water, &c., ii, 19, 20; methods of ascertaining depth of strata, ii, 20; conveyance of spring-water, ii, 21.
[See also sub-heading Covered drains.]

Draughts in plant-houses—structures for prevention of, i, 20.

Drosera—cult. as bog plant, i, 385.

Dryas—species, &c., descript. and cult., i, 357.

Drying or Evaporating Fruit and Vegetables—
Development of industry in America, &c.—state of trade in Britain, ii, 344, 352, 353.
Expenses and profits—cost of carriage in comparison with fresh fruit, ii, 356, 357.
Illusts. of appliances, &c.—apple parer, corer, and slicer, ii, 45, 354, 355; "Gnom" fruit and vegetable driers, ii, 357, 359; "Invicta" fruit and vegetable drier, ii, 360.
Methods and appliances for various products, ii, 44, 45, 353-356; fuel used, ii, 355; table giving comparative weights of fresh and dried fruit and vegetables, and temperature and time required for operation, ii, 356.
Placing upon market, methods of packing, &c., ii, 356.

Drynaria—(see *Polypodium*).

Dumb-cane plants—descript. and cult., i, 549.

Dungs as manure—differences in various dungs, influence of litter used, &c., i, 160; nitrogen in, analyses table, ii, 464. (For special dung, see its name.)

Dutch honeysuckle—descript. of, i, 308.

Dutchman's pipe—descript. of tree, i, 289.

Dwarf ferns—descript. of, i, 608.

E

Earth thermometer—(illust.), *descript.* of, i, 23, 24.
Earthworms—as garden friends, i, 119.
Earwigs—*descript.* and *treatment*, i, 72, 76.
Echeveria—(see *Cotyledon*).
Echinacea—*descript.*, *cult.*, and *illust.* of, i, 357.
Echinocactus—*species*, &c., *descript.* and *cult.*, i, 618.
Echinocereus—(see *Cereus*).
Echinops—*species*, &c., *descript.* and *cult.*, i, 357.
Echinopsis—*species*, &c., *descript.* and *cult.*, i, 618.
Echites nutans—as a stove plant, i, 550.
Echium—*descript.*, *cult.*, and *illust.* of, i, 534, 535.
Edelweiss—*descript.* and *cult.*, i, 363.
Edwardia grandiflora and *var.*—*descript.* of, i, 299.
Eel fern—*descript.* of, i, 586.
Eel-worm—(see *Root-gall*).
Egg-cells—*formation* of (illust.), i, 48, 53, 54.
Egg-plants—greenhouse plants, *descript.* and *cult.*, i, 542.
Egg-plants—(illust.), *descript.*, *origin*, *uses* of fruits, *cooking* and *cultural directions*, ii, 441, 442; *foreign names* of, ii, 527; *calendrical directions*, ii, 533, 536, 539, 542, 543, 544, 546.
Egyptian Lotus lily—*descript.* and *cult.*, i, 382.
Egyptian paper reed—*descript.* of, i, 385.
Eichornea azurea—*descript.* of, i, 381.
Elæagnus—*species*, &c., *descript.* and *cult.*, i, 300.
Elaphoglossum—(see *Acrostichum*).
Elatér lineatus—(illust.), *descript.* and *remedies*, i, 111.
Elder-tree—*descript.* and *cult.*, i, 320, ii, 273; *cult.* and *uses* of berries, ii, 273.
Elecampane—*foreign names* of vegetable, ii, 527.
Electric light—*influence* of on reproduction of plants, i, 49.
Elk's-horn fern—(illust.), *descript.* of, i, 598.
Elm-trees—*pruning*, i, 254, 255; *descript.* of *species*, &c., i, 324.
Emasculatión of anthers—*process* of, i, 60.
Emberiza citrinella—as garden friends, i, 116.
Embothrium coccineum—*descript.* of, i, 300.
Embryo—*formation* of (illust.), i, 60.
Embryo of almond—(illust.), i, 38.
Embryo plant—*production* of, i, 48, 53.
Embryo-sac—*formation* (illust.), i, 48, 53, 54, 60; *fertilization* of ovule (illust.), i, 53, 54, 60.
Empetrum nigrum and *vars.*—*descript.* of, i, 300.
Emphytus cinctus—(illust.), *descript.* and *treatment*, i, 91.
Encephalartos—*species* of, *descript.* and *cult.*, i, 615; *illust.* of cones, i, 613.
Endive—crops endive may follow and be succeeded by, ii, 390; seed quantities, ii, 391; *descript.*, *illust.*, and *uses* of, ii, 442; *general cult.*, *blanching* and *forcing directions*, ii, 442, 443; *protection means*, *saving seeds*, *list* (illust.) of *vars.*, ii, 443, 444; *foreign names* of, ii, 527; *calendrical directions*, ii, 532, 541, 543, 546, 548, 550, 552, 554, 555, 558, for *forcing*, ii, 533, 536, 542, 554, 556, 559; *packing*, ii, 564.
Endopisa proximana—*descript.* and *treatment*, i, 77.
Endosperm—*formation* of, i, 53, 57.
Engines for watering—(illust.), *management* of, i, 186-188.

VOL II.

English broom—*descript.* of, i, 298.
Enkianthus—*species* of, *descript.*, i, 300.
Entelea arborecens—for the subtropical garden, i, 643.
Epacris—*calendrical directions*, i, 17; *species*, &c., *descript.* and *cult.*, i, 535.
Epsira diademata—as garden friend, i, 122.
Epergne, &c., for floral decoration—*illust.* and *use* of, i, 652, 653.
Ephedra altissima, monastachya, and *distachya*—*descript.* of, i, 300.
Epiblemum scenicum—(illust.), as garden friend, i, 122.
Epicattleya—*origin*, &c., of orchids, i, 575.
Epidendrum—*calendrical directions*, i, 7, 13; *species*, &c., *descript.* and *illust.*, i, 575, 576.
Epidermis and epidermal cells of leaf—*formation* of (illust.), i, 39, 40.
Epigaea repens—*descript.* of, i, 300.
Epilælia—*origin*, &c., of orchids, i, 576.
Epilobium—*species*, &c., *descript.* and *cult.*, i, 357.
Epimedium—*species*, &c., *descript.* and *cult.*, i, 358.
Epiphronites—*illust.* of E. Veitchii, i, 566; *origin*, &c., of orchids, i, 576.
Epiphyllum—*calendrical directions*, i, 2, 6, 10, 18, 19; *species*, &c., *descript.*, *cult.*, and *illust.* of, i, 438, 439; *insect pests*, i, 439.
Episcea (Cyrtodeira)—*species*, &c., *descript.* and *cult.*, i, 550.
Equisetum Telmateia—*descript.* and *cult.* of, i, 385.
Eranthemum—*calendrical directions*, i, 6, 10, 15; *species*, &c., *descript.* and *cult.*, i, 550.
Eranthis—*species*, &c., *descript.* and *cult.*, i, 358; *spring-bedding* E. hyemalis, i, 630.
Ercilla spicata—*descript.* of, i, 300.
Eremurus—*species*, &c., *descript.* and *cult.*, i, 358.
Erica—*calendrical directions*, i, 18; *hardy species*, *descript.* and *cult.*, i, 300; *popular garden plants*—*descript.*, *illust.*, *cult.*, *propagation*, *housing*, &c., i, 439, 440, *list* of *species*, i, 441, 442; *spring-* and *winter-bedding plants*, i, 630, 647.
Erigeron—*species*, &c., *descript.* and *cult.*, i, 358.
Eriobotrya japonica—as a greenhouse tree, i, 535.
Eriocampa limacina and E. Rosæ—(illust.), *descript.* and *treatment*, i, 94.
Eriophorum polystachyon—*descript.* and *cult.*, i, 385.
Eriopsis—*descript.* of orchids, i, 576.
Eriostemon—*species*, &c., *descript.* and *cult.*, i, 535.
Erodium—*species*, &c., *descript.* and *cult.*, i, 358.
Ervum Lens—(illust.), *descript.*, *uses*, and *cult.*, ii, 456.
Eryngium—*species*, &c., *descript.*, *cult.*, and *illust.*, i, 358.
Erysimum Perofskianum—*descript.* and *cult.* of, i, 391.
Erythaca rubecula—as garden friend, i, 118.
Erythea—*species* of, *descript.* and *cult.*, i, 610.
Erythraea—*descript.* and *cult.* of, i, 358.
Erythrina—*descript.* and *cult.* of greenhouse *species*, i, 535; of stove *species*, i, 550; of subtropical garden plants, i, 644.
Erythronium—*species*, &c., *descript.* and *cult.*, i, 358.
Escallonia—*species*, &c., *descript.*, *cult.*, and *illust.* of, i, 300, 301.
Eschscholtzia—*species*, &c., *descript.* and *cult.*, i, 391.
Esmeralda—*descript.* of orchids, i, 576.
Estates—*plantation* of timber on, i, 273, 274.
Eucalyptus—*species* of, *descript.*, *cult.*, and *illust.* of, i, 535; E. globulus for subtropical garden, i, 644.
Eucharis—*calendrical directions*, i, 15; *popular garden species*, &c.—*descript.*, *origin*, *cult.*, and *illust.* of, i, 442; *insect pests*, i, 100, 422.
Eucharis mite—*descript.* and *treatment*, i, 100.
Eucomis—*species*, &c., *descript.* and *cult.*, i, 359.
Eucryphia pinnatifolia—(illust.), *descript.* of, i, 301.
Eulophiella—*species* of, *descript.* and *cult.*, i, 576.
Eumerus æneus—(illust.), *descript.* and *treatment*, i, 99, 100.
Euonymus—*calendrical directions*, i, 3, 19; *species*, &c., *descript.* and *cult.*, i, 301, 302; *winter-bedding plants*, i, 647.
Eupatorium—*calendrical directions*, i, 6, 12; *species*, &c., *descript.* and *cult.*, i, 535.
Euphorbia—*descript.* and *cult.* of E. splendens as stove plant, i, 550; *descript.*, *cult.*, and *illust.* of succulent plants, i, 618, 619.
Euphorbia jacquiniæflora—*calendrical directions*, i, 7, 9, 10, 13, 19; *descript.* and *cult.* as stove plant, i, 550.
Euphorbia pulcherrima—(see *Poinsettia*).
Eutaxia myrtifolia—as a greenhouse shrub, i, 535.
Euterpe—*species* of, *descript.* and *cult.*, i, 610.
Evaporating fruit and vegetables—(see title *Drying* or *Evaporating*).
Evaporation, process of—*leaf* and *stomata functions*, i, 41, 44.
Evening primrose—*descript.* and *cult.*, i, 367.
Evergreen honeysuckle—*descript.* of, i, 308.
Evergreen trees and shrubs—(see title *Trees and Shrubs*).
Everlasting flowers—*descript.* and *cult.*, i, 388 (illust.), 392, 397, 399; *greenhouse sorts*, i, 536.
Evolution of horticulture—*influence* of hybridism, i, 58.
Exacum zeylanicum—as a stove plant, i, 550.
Exoascus deformans—*development* and *treatment*, i, 129.
Exotic plants—*non-production* of seeds and *influence* of insects on fertilization of, i, 54.

F

Fabiana imbricata—*descript.* of, i, 302.
Fagus sylvatica and *vars.*—(illust.), *descript.* of, i, 302.
Fair maid of France—*descript.* and *cult.* of, i, 372.
Fairchild's mule pink—*descript.* of first garden hybrid, i, 58.
False acacia—*descript.* of, i, 318.
Fan-palm—*descript.* of, i, 611.
Farfugium—*calendrical directions*, i, 6; F. grande for subtropical garden, i, 644.
Farmyard manure—*composition* and *uses* of, i, 156, 160, 162.
Fatsia (Aralia)—*descript.* and *cult.* of *species*, i, 302; as greenhouse shrubs, i, 535; for subtropical garden, i, 644.
Fences and hedges—*commercial fruit-plantations*, *expenses* and *merits* of various hedges for, ii, 33, 76; *box used* for (see *Box*).
Fennel—*descript.*, *uses*, and *cult.* of Sweet and Fenocchio (illust.) fennel, ii, 444, 541; *foreign names* of, ii, 527.
Fennel—*ornamental plants*, *descript.* and *cult.*, i, 359.
Fennel flower—*descript.* and *cult.* of, i, 396.

Ferdinanda eminens—for the subtropical garden, i, 644.

Ferns—

Calendarial directions, i, 6, 9, 10, 13, 18.

Decorative—descript. and uses of, i, 527, 584, 585; 603, 604.

Hardy—

Cultivation—general treatment, construction of rockery (illust.), i, 603, 604; culture in pots and under glass, i, 603, 604.

Species, &c.—descriptive list (illusts.), i, 604-608; for water margins, i, 385.

Hybridization—fertilization in ferns, i, 64, 65.

Insect pests—treatment of, i, 92, 584, 603.

Propagation—by spores, by division, &c., i, 226, 227, 236, 584.

Stove and greenhouse—

Construction and management of house, regulation of temperature, &c., i, 582, 583, 585; illust. of fernery, i, 583.

Decorative ferns—descript., cult., and uses, i, 584; for cutting, for Wardian cases, for rockeries and for walls of plant-houses, i, 585.

General treatment, i, 582, 583; soil for, i, 141, 583; potting, &c., i, 584.

Species, &c.—descriptive list (illusts.), i, 586-601.

[See also titles Lycopodiums, Selaginellas.]

Structure and functions, i, 30, 37—vascular bundles, i, 37, spores (illust.), i, 64, life-history of a fern (illust.), i, 64.

Subtropical garden—cult. of ferns in, i, 642.

Fertility and interpollination—influence of foreign pollen on formation of fruit, ii, 49.

Fertilization—

Artificial process, i, 55.

Autogamy or close-fertilization—process of, i, 51, 54, 55; prevention of in hermaphroditic flowers, i, 59; isolation to fix varieties, i, 62.

Cross-fertilization—process and advantage of, i, 51, 54, 55; difference of hybridization, i, 55.

Cryptogamic or flowerless plants, i, 64.

Fruits—introduction of cross-fertilization and prevention of self-fertilization, ii, 47; imperfect fertilization of pears, cause, &c., ii, 123; report on the pollination of pomaceous fruit, ii, 123, 124.

Fusion of nuclei—descript. of process, i, 48, 53; appearance of sports, i, 55, 65.

Hybridization (see that title).

Pollination—process of, illusts. of style and ovule, &c., i, 53, 54, 57, 60; protection of pollen-stamen formation, i, 51; dispersal of pollen by wind and by insect agency (illust.), i, 54, 59; pomaceous fruit, ii, 123, 124.

Ferula—species, &c., descript. and cult., i, 359.

Fibres of leaves—formation and functions of, i, 39.

Fibres of wood—formation of (illust.), i, 28.

Ficus—descript. and cult. of greenhouse species, i, 536, of stove species, i, 550; *F. elastica* in subtropical garden, i, 644; *F. Carica* (illust.), and the origin and cult. of figs, ii, 212, 213.

Fig-Marigold—descript. and cult. of, i, 395.

Figs—

Calendarial directions—outdoor, ii, 536, 539, 542, 556, 558; for forcing, ii, 534, 537, 539, 542, 545, 547, 549, 553, 553, 554, 557, 559.

Capriciation of inflorescences—use of process, i, 58; ii, 214.

Character and formation of the fruit—descript. and illusts., ii, 213; nature of trees planted in Southern Europe, ii, 214.

Culture in open air—soil and situation, ii, 214; fruiting, growth of shoots and fruit-buds (illusts.), ii, 214-216; pruning and training, illust. of giant tree, &c., ii, 216, 217; protection and propagation, ii, 217, 218.

Figs (cont.)—

Culture under glass—construction and management of house, i, 208; ii, 218, 274; advantages of, ii, 218; general treatment of trees in borders or pots (illusts.), ii, 218-220; orchard-house treatment, ii, 274, 275.

Insect pests—treatment of, ii, 220.

Lists of vars.—for British culture (illusts.), ii, 220-222, for orchard-house cult., ii, 275.

Origin and history of, ii, 212.

Packing methods, ii, 377.

Figure-of-8 moth—(illust.), descript. and treatment, i, 85.

Figlibert—(see Hazel-nut).

Filmy ferns—for Wardian cases, i, 585; descript. and cult., i, 601.

Finches—fruit and seed enemies, i, 75; garden friends, i, 117.

Finger-and-toe disease—(see Anbury disease).

Fire thorn—descript. of evergreen, i, 298.

Firs—pruning, i, 256; general cult., soil, &c., i, 327, 328; descript. and cult. of silver fir group, i, 328, of spruce firs, i, 331, of hemlock spruce, i, 335.

Fish guanos—as manure, i, 157, 158.

Fittonia—species of, descript. and cult., i, 550.

Flax plant—descript. and cult., i, 364.

Flies—as plant enemies, i, 77, 79, 86, 95, 96, 99, 101, 102, 103, 107, 108, 112; as garden friends, i, 117, 120, 121.

Floral Decoration—

Baskets, &c., for drawing-rooms, presentations, &c.—arrangement of (illust.), i, 654, 655.

Domestic decorations—descript. of, i, 647. (See also sub-headings Baskets, Table, Vases.)

General preparation of materials—cutting and wiring flowers, use and method of making gum, &c., i, 647-649.

Personal—descript. of, i, 647; hand-bouquets and illust. of stand, i, 649-651; button-hole bouquets, head-dresses, i, 651.

Table—plants suitable for, i, 12; flower-receptacles, &c., i, 652; arrangement of flowers (illust.) and fruit on dinner-table, i, 654, 655.

Vases and flower-stands for various purposes (illusts.), i, 651-653; flower-rack (illust.), use of, i, 651; arrangement of flowers, directions and illusts., i, 652-655.

Wreaths and crosses, i, 647, 651, illust. of, i, 655.

Flower—(see Flowers).

Flower-beds—formation of (see title Flower-gardens and Pleasure-grounds).

Flower-buds—growth of, i, 46; buds of the inflorescence, illust. and growth of, i, 47; production of fruit, explanation and illusts., ii, 169-171, 173.

Flower enemies—insect and other pests (illusts.), descript. and treatment, i, 71-74.

Flower-gardens and Pleasure-grounds—

Bedding (see sub-heading Formation of Flower-garden; for special bedding, see titles Spring-bedding, Carpet-bedding, &c.).

Calendar of operations (see that title).

Decorations—use of fountains, statuary, summer-houses, &c., i, 258, 268, 269, 276, 277.

Formation of flower-garden—

Aspect, extent, position, &c.—general remarks on, i, 258-260.

Beds—formation (illust.) and planting, design and colour considerations, i, 260, 263, 264, 637.

Hardy perennial garden, i, 265, 266.

Plans for—illusts. and explanations of various styles, i, 262-264; illust. of garden at Kew, i, 632.

Flower-gardens and Pleasure-grounds

(cont.)—

Preparation of the ground, drainage, &c., i, 260, 261.

Reserve garden, i, 265.

Rootery for screening unsightly objects, i, 268.

Formation of pleasure-grounds—

Approach road and chief walks—leveling, construction, and courses (illust.), i, 269, 271, 272.

Ground work—general directions, i, 269.

[See also sub-headings Decorations, Trees and Shrubs; and titles Rose-garden, Rock-garden, &c.]

Lawns, Bowling-grounds, &c.—

Formation, drainage, turf, &c., i, 277-280.

Keeping in order—manures, &c., suitable, i, 279.

Soil, &c., for flower-garden, i, 141, 260, 261, 269.

Trees and Shrubs—

Arrangement of shrubberies, &c., i, 284.

Calendarial directions, i, 3, 5, 8, 14, 17, 19, 20.

Conifers suitable, i, 327.

Illust. of grouping, i, 272.

Pruning and manure, i, 274.

Selections for various purposes, i, 258, 269-271, 272-275; choice of specimens to suit neighbourhood, i, 283, for water-banks, i, 281, 282, 283, 378, for sea-side, i, 283, 335, 336.

Water, ornamental—formation of lakes, ponds, &c. (illust.), plantations suitable, i, 280-282.

Water-supply—appliances and means for, i, 261, 277.

[See also titles American Garden, Rock-garden, Rose-garden, Subtropical Garden, Wild Garden.]

Flower rack—(illust.), use of, i, 651.

Flower-scissors—(illust.), use of, i, 179, 180.

Flowering currant and vars.—descript. of, i, 318.

Flowering dogwood—descript. of, i, 297.

Flowering plants—descript. and construction, i, 31; reproduction of, i, 48-58; book of reference on, i, 67; plants suitable for conservatory decoration, i, 527.

Flowering rush—descript. of, i, 381.

Flowering trees suitable for town parks, gardens, &c., i, 339. (Special tree, see its name.)

Flowerless plants—Fertilization and hybridization, i, 64.

Flowers—

Calendarial directions (see Calendar of Operations in the Flower-garden).

Conditions requisite for production of, i, 48, 49.

Conformation of the flower—descript. and illusts., i, 49-53.

Cutting, packing, and keeping cut flowers—directions, i, 472, 568, 648; boxes for packing, sizes and prices, ii, 369.

Floral decoration (see that title).

Improvements due to judicious cross-fertilization and hybridization, i, 58.

Insect agency—influence on form of flowers, i, 54.

Parts of a flower—descript. and illusts., i, 49-53. (See also names of parts.)

Signs used for marking unisexual and hermaphrodite flowers, i, 49.

Soil suitable for, i, 141, 260, 261, 269.

Types of, descriptions—male and female, i, 49; hermaphroditic, i, 49, 59; monoecious and dioecious, i, 50, 59; complete and incomplete, i, 50; regular and irregular, i, 50; double (illust.), i, 63; cleistogamous, i, 54.

[See also titles Flower-gardens, Fertilization, Hybridization, Reproduction.]

Flues—heating by, i, 216.

Fluids in plants—movement of, i, 44.
Fly-catchers—as garden friends, i, 117.
Foam-flower—descript. and cult., i, 375.
Foeniculum vulgare—descript., uses, and cult., ii, 444.
Food of plants—(see Nutrition).
Foot-level—(illustr.), descript. and use of, i, 183, 184.
Forcing—
 Calendrical directions for fruit or vegetable (see Calendar of Operations in the Fruit- and Kitchen-gardens).
 Calendrical directions for management of plant-houses, i, 2, 4, 6, 7, 9, 18, 20.
 Hardy shrubs—treatment and list of shrubs suitable, i, 621-625.
 Herbaceous plants and bulbs—directions and kinds suitable, i, 625-627.
 [For special fruit or vegetable see its name—plants, see generic titles.]
Foreign names of culinary vegetables—lists of, ii, 527-531.
Forficula auricularia—descript. and treatment, i, 72.
Forget-me-nots—descript. and cult. of perennial species, &c. (illustr.), i, 366, 367, of Chatham Island forget-me-not, i, 366, of marsh plants, i, 386, of annual species, &c., i, 396.
Forks—(illustr.), descript. and use of, i, 174.
Forsythia—pruning (illustr.), i, 256, 257; species, &c., descript. and cult., i, 302; forcing *F. suspensa*, i, 622.
Fothergilla alnifolia—descript. of, i, 302.
Fountains—for garden decoration, i, 258, 268, 269.
Fragaria—species of and the origin of strawberries, ii, 238.
Fraiser Ananas and the origin of strawberries, ii, 238.
Frames—(see Pits and Frames).
Francoa—calendrical directions, i, 8; species, &c., descript. and cult., i, 359.
Fraxinus—species, &c., descript. and cult., i, 302.
Freesia—calendrical directions, i, 6, 14, 17, 18; descript. and cult., i, 536, forcing directions, i, 626.
Fregilus graculus—as garden friend, i, 117.
Fremontia californica—descript. of, i, 302.
French bean—(see Kidney bean).
French bean canker—(illustr.), i, 129.
French names of culinary vegetables—lists of, ii, 527-530.
Fringe-tree—descript. of, i, 295, forcing directions, i, 622.
Fringilla coelebs—as garden friend, i, 117.
Fritillaria—species, &c., descript., cult., and illustr. of, i, 359, for forcing, i, 626.
Frogs—as garden friends, i, 119.
Fruit—
 Arrangement in dishes on dinner-tables, &c., i, 654.
 Calendrical directions (see Calendar of Operations in the Fruit- and Kitchen-gardens).
 Conveyance by road or rail—railway rates, ii, 79, 135; dried fruits, cost of carriage as compared with fresh fruit, ii, 357. (See also title Packing fruits.)
 Culture for commercial purposes (see titles Fruit plantations, Apples, &c., for Market, Pears for Market).
 Culture in America, Germany, and France in comparison with that of Great Britain, ii, 344, 352, 353.
 Culture under glass—conditions for forcing, i, 57; ii, 312. (See also title Orchard-house; for special fruit, see its name.)
 Formation (illustr.), and descript. of various classes of fruit, i, 56-58.
 Improvement of—results of judicious fertilization, hybridization, and systematic treatment, i, 58, 59; ii, 47, 48, 99-102.

Fruit (cont.)—
 Insect and other pests—(illustr.), descript. and treatment, i, 74-79.
 Keeping fruit (see titles Fruit-room, Storing fruit).
 Meaning of term "fruit", i, 56.
 Packing and packing-house (see title Packing fruits).
 Pollination—interpollination of fruits, influence of foreign pollen on formation of fruit, ii, 49; pomaceous fruits, extract from report on, &c., ii, 123, 124.
 Preserving (see title Fruit-preserving).
 Ripening process—explanation of, i, 56; ii, 380, 381.
 Seeds—descript. (illustrs.) and germination, i, 32, 53, 56, 57.
 Storing (see titles Fruit-room, Storing fruit).
 Supplying a regular amount of fruit to an establishment—area of ground, &c., required, ii, 4, 5.
 Surplus and waste fruit—utilization of (see Fruit-preserving).
Fruit- and Kitchen-garden, formation of—
 Consideration of principal points in, ii, 1.
 Drainage (see that title).
 Form of the garden—descript., illustrs., and merits of various forms, ii, 7-9. (See also sub-headings Plans, Walls.)
 Fruit-tree borders—width, depth, slope, &c., ii, 25, 26; concrete paving for bottom of (illustr.), ii, 26, 27; soil suitable and materials for improvement, ii, 27-29.
 Level of the ground—determination of (see title Levelling).
 Orchards (see that title).
 Plans (illustrs.)—large garden, ii, 4, small garden, ii, 5, garden at Welbeck, ii, 4; site for garden in relation to mansion, ii, 2; site for garden in flat or exposed situation, and position of shelter trees, ii, 11; site showing drainage scheme, ii, 21; methods of dealing with slopes, ii, 18.
 Preparation of the ground—methods of trenching, &c., ii, 29, 30.
 Shelter—artificial means, effect and use of walls and trees (illustr.), ii, 10, 11.
 Site—choice of, position in relation to house, ii, 1, 2; sheltered site, ii, 9. (See also sub-heading Plans.)
 Size—space for various structures, area required to supply given quantity of produce, walled-in areas, &c., ii, 4, 5.
 Soil suitable for—choice, depth, and improvement of, ii, 2-4, 27-29.
 Walks—construction, cost of cement walks, &c., edgings suitable, ii, 30-32.
 Walls—aspect consideration, action of sun's rays, ii, 5, 6, 8; merits and diagrams of southern and other positions, ii, 6-8; length of wall needed to enclose given areas and expenses incurred, ii, 8, 9; shelter uses of, ii, 10, 11.
Fruit- and Kitchen-gardens—calendar of operations (see Calendar of Operations in the Fruit- and Kitchen-gardens).
Fruit juices—imitation fruit essences, use of, ii, 102; commercial value of, and use in production of non-alcoholic drinks, ii, 358, 364.
Fruit plantations for commercial purposes—
 Uses of hardy fruits—consideration of ways available for marketing fruits, modes of preserving, &c., ii, 358.
 [See also titles Apples, &c., for Market, Pears for Market.]
Fruit-preserving—
 Advantages of an extension of knowledge in methods of fruit-preservation, ii, 344.
 Development of trade—British and foreign industries compared, trade in U.S.A., suggestions for extension of home trade, &c., ii, 344, 345, 352.
 Hardy, stone, and small fruits—special uses, vars., and modes for preserving, ii, 358-364.

Fruit-preserving (cont.)—
 Methods and appliances—summary and classification of principal methods, ii, 345, 346, miscellaneous methods, ii, 358, 364. (For particular method, see titles Jam-making, Canning, Bottling, &c.; for special fruit, see its name.)
 Packing and storing preserved fruit, ii, 348, 356.
Fruit-protectors—(illustr.), use of, i, 125.
Fruit-room—
 Atmosphere, ventilation, and moisture—regulation directions, descript. of Lawton process of sterilizing the air, i, 210; ii, 384, 385.
 Construction—(illustrs.), general forms and directions, i, 212; Bunyard's fruit-room, i, 213, 214; fruit-room at Foxbury, ii, 77-79; details as to divisions, trays, light, &c., ii, 69, 70, 212, 214, 382, 383, 385.
 Floor and path materials, ii, 385.
 Keeping the fruit (see title Storing).
 Rats, mice, and thieves—protection against, i, 214; ii, 383.
 Temperature regulations, i, 210; ii, 384, in cold storage, ii, 388.
 Wine-cellar used as fruit-room—descript. of, i, 212, 213.
Fruit-trees—
 Calendrical directions (see Calendar of Operations in the Fruit- and Kitchen-gardens).
 Culture of fruit (see titles Fruit, Orchard-house; special fruit, see its name).
 Formation of fruit-garden (see title Fruit- and Kitchen-garden).
 Fruitfulness—modes of promoting, i, 247, 257, 258; cause and treatment of sterility, i, 257; ii, 39, 49, 68, 123, 124.
 Hybridization—rearing trees from seed, isolation system, i, 63.
 Orchard plantation and management (see Orchards).
 Pruning and training—root-pruning and ringing, i, 257, 258. (Special tree, see name of fruit).
 Retarding process applied to trees in pots or otherwise, i, 628.
 Spraying fruit-trees (see that title).
 Treatment of trees on arrival after conveyance by rail, &c., ii, 58.
Fuchsia—calendrical directions, i, 4, 8, 10, 11, 12, 14, 17; species, &c., descript. and cult., i, 302; popular forms—(illustrs.), descript. origin, and cult., i, 442-444, list of best vars., i, 444; exhibition plants and fuchsias in greenhouse, treatment of, i, 443, 444; insect pests, i, 443; summer-bedding forms—cult. and illustr., i, 632, 634.
Fumigators—(illustr.), descript. and use of, i, 189.
Fungi, Plant Diseases caused by—
 Anbury or finger-and-toe (see Anbury disease).
 Anemone disease (illustr.), i, 127.
 Apple-tree canker (illustr.), i, 125.
 Cherry-leaf disease in Kent and elsewhere, ii, 210.
 "Damping off" of seedlings, i, 128.
 French bean canker (illustr.), i, 129.
 Fungicides, descript. and application of, i, 129-131; ii, 43, 44.
 General observations on, i, 123.
 Gymnosporangium—formation on juniper branch, &c. (illustr.), i, 127.
 Increase of fungoid pests during warm wet weather, i, 65.
 Kind of food required by fungi, i, 123.
 Literature on, i, 131.
 Mildew (see that title).
 Mould or sclerotinia (illustr.), i, 126, 127.
 Pæony drooping disease (illustr.), i, 130.
 Peach leaf curl, i, 129.
 Pear-leaf fungus (illustr.), i, 127.
 Potato disease (see that title).
 Preventing a repetition of a disease, i, 125-129.

Fungi, Plant Diseases caused by (*cont.*)—
Preventing the spread of a disease, i, 125.
Spraying fruit-trees (see that title).
Strawberry-leaf fungus (illust.), i, 130.
Structure and reproduction of fungi, i, 123,
different modes of reproduction, i, 124.
Tomatoes—fungus diseases attacking, ii,
340, 341.
Trees and shrubs damaged by storm—
development of disease, i, 252, 253, 254.
[For diseases on special plants, see generic
titles of plants.]

Fungicides—description and application of,
i, 129-131; ii, 43, 44.

Funkia—species, &c., description and cult.,
i, 359; forcing forms and directions, i,
626.

Furcraea—species, &c., description and cult.,
i, 618, 619.

Furnaces for heating glass-houses, &c.—
(illusts.), description and management,
i, 277.

Furze—description of shrub, i, 324.

Fusarium Lycopersici—treatment of in
tomatoes, ii, 341.

G

Gaillardia—calendarial directions, i, 5;
hardy species, i, 359; popular garden
sorts—(illust.), description, origin, cult.,
and list of best vars., i, 444; summer-
bedding directions, i, 635.

Galanthus—species, &c., description, cult.,
and illust. of, i, 359; forms for spring-
bedding, i, 630.

Galega—species, &c., description and cult., i,
360.

Galtonia candicans—description and cult.,
i, 360, for summer-bedding, i, 635.

Garden chafer—description and treatment,
i, 85, 105.

Garden enemies—insects, &c. (see title
Insect and other Plant Enemies).

Garden friends—insects, &c. as, description
and illusts., i, 114-122.

Garden line and reel—description and use
of, i, 181.

Garden pebble moth—description and treat-
ment, i, 85.

Garden refuse—as manure, i, 156.

Garden snail—description and treatment, i,
93.

Garden spider—as garden friend, descrip-
tion of, i, 122.

**Garden Structures, Construction and
uses of—**
Frames, i, 204, wall-frames, i, 210.
Fruit-room (see that title).
Glass-houses (see that title).
Heating methods (see Heating).
Ice-house (illust.), i, 215, 216.
Painting and repairing, i, 210.
Pits (illust.), i, 204, 205.
Pleasure-ground summer-houses, arbours,
temples, &c., i, 276, 277; rose-temple,
i, 275.
Vineries (see that title).
Walls—colour, construction (illust.), &c.,
i, 196-199. (See also title Fruit- and
Kitchen-garden.)
Water-garden—boat-house, Chinese pa-
goda, &c., i, 281.

Gardeners—demand for practical men in
commercial fruit plantations, &c., ii,
73; employment and availability of
labour in certain districts, ii, 74, 75.

Gardenia—calendarial directions, i, 4, 7, 9,
15; root disease, illust. and remedies,
i, 105; description, cult., and illust. of
plants, i, 550.

Garland flower—description and cult., i, 361.

Garlic—description, uses, illust., and cult. of,
ii, 444, 445; foreign names of, ii, 527;
calendarial directions, ii, 535, 541, 548,
550, 554, 556.

Garlic snail—description and treatment, i, 93.

Garra elliptica—(illust.), description of, i,
302.

Gas—heating structures by means of, illust.
and description of gas-stove, i, 222.

Gas waste—as a manure, i, 164.

Gasteria—species, &c., description and cult.,
i, 619.

Gaultheria—species of, description and cult.,
i, 302, 303; *G. procumbens* for winter-
bedding, i, 647.

Gazania splendens—for summer-bedding,
i, 635.

Geane—(see Cherry).

Genealogical arrangements of plants
—explanation of systems used, i, 66.

Genista—species, &c., description and cult.,
i, 393.

Gentiana—species, &c., description, cult., and
illust. of, i, 360.

"Genus"—botanical meaning of term, i, 66.

Geometrical flower-garden—(illust.),
formation of, i, 263, 264.

Geonoma—calendarial directions, i, 2; de-
scription and cult. of, i, 610.

Geophilus longicornis—description and
remedies, i, 106.

Geranium—calendarial directions, i, 11;
hardy species, description and cult., i,
360; popular garden forms (see *Pelargonium*).

Gerbera Jamesoni—description and cult.,
i, 360.

**German names of culinary vege-
tables**—lists of, ii, 527-530.

Germination of seeds—i, 32, 57.

Gesnera—calendarial directions, i, 7, 10, 12,
15, 18; species, &c., description and cult.,
i, 550.

Geum—species, &c., description and cult., i, 360.

Ghent azaleas—(see *Azalea*).

Ghent mould—composition of, i, 151, 152.

Gherkins for pickling—cult. of, ii, 329.

Ghost swift moth—(illust.), description and
remedies, i, 105, 106.

Giant bellflower—(illust.), description and
cult., i, 368.

Gilia—species, &c., description and cult., i, 391.

Gillenia—description and cult. of *G. trifoliata*,
i, 360.

Ginkgo biloba—description of, i, 330.

Gladiolus—calendarial directions, i, 3, 6, 8,
11, 14, 17, 19; herbaceous border plants,
i, 360; popular races and strains—de-
scription, origin, illusts., and general and
pot-culture, i, 445, 446, list of vars., i,
446; forcing forms and directions, i, 626;
summer-bedding directions, i, 635.

**Glass-houses, &c., Construction and
Uses of—**
Bell-glasses and hand-glasses (illust.), i, 195,
196.
Curvilinear roofs (illust.), i, 203, 204.
Fundamental principles of construction, i,
199.
Greenhouses and Conservatories (see that
title).
Heating methods (see Heating).
Himalayan house at Kew—(illust.), de-
scription of, i, 210.
Hot-houses (illust.), i, 209, 210.
Lean-to roof house (illust.), i, 201.
Orchard house, ii, 273, 274.
Pits and Frames (see that title).
Ranges of glass-houses—description and illust.
of structures and ground plan, i, 210,
211.
Ridge-and-furrow roofs, i, 202.
Roof construction—angles of elevation,
table showing angles necessary by
various dimensions, &c., i, 199-201;
angles of incidence and the reflection
of rays of light and sun upon glass, i,
200, 201.
Span-roofed and unequal span-roofed
houses (illust.), i, 201-203.
[For special fruit-houses, see title Vineries;
also names of fruits—sub-headings
Culture under glass, &c.]

Glazing fruit—(see title Crystallizing and
Glazing).

Gleditschia—description of *G. triacanthos*, i,
303.

Gleichenia—species, &c., description, cult.,
and illust. of, i, 593.

Globe flower—description and cult. of, i, 376,
387.

Gleospodium lindemuthianum—illust.
and description, i, 129.

Gloriosa—species, &c., description and cult.,
i, 551.

Glory of the snow—description, cult., and
illust., i, 353, 354.

Glory pea—description and cult., i, 533.

Glow-worm—as a garden friend, i, 115.

Gloxinia—calendarial directions, i, 4, 7, 10,
12, 15, 18; popular garden types—
(illust.), description, origin, and cult., i,
446.

Glycyrrhiza glabra—(illust.), description,
uses, and cult., ii, 461.

Gnomonia erythrostoma—description and
treatment of leaf disease, ii, 210.

Goat moth—(illust.), description and remedies,
i, 113, 114.

Goat's Rue—description and cult., i, 360.

Godetia—species, &c., description and cult.,
i, 391.

Gold ferns—description and cult. of, i, 594.

Golden drop—(illust.), description and cult.
of, i, 367.

Golden feather—for spring-bedding, i, 630.

Golden osier—description of shrub, i, 320.

Goniophlebium—(see *Polypodium*).

Goniopteris—(see *Polypodium*).

Good King Henry—description, uses, cook-
ing, and cult. of vegetable, ii, 445.

Goodia lotifolia—as a greenhouse plant,
i, 536.

Gooseberries—
Calendarial directions, ii, 533, 550, 554, 556,
558.
Fruiting shoot of spineless gooseberry
(illust.), ii, 223.
Insect pests, &c.—list of, ii, 226.
List of vars.—description, illusts., and se-
lections for special purposes, ii, 226-229.
Market-garden purposes—demand for, ii,
75.
Origin and history—merits of the fruit for
cultivation, ii, 222.
Packing—methods of, ii, 378; boxes for,
ii, 368.
Planting—orchard plans (illusts.), ii, 32, 37;
general instructions, ii, 222.
Preserving—vars. and modes suitable, ii,
364; processes of jam-making, ii, 346,
jelly-making, ii, 349, bottling, ii, 351.
Propagation—by seeds, cuttings, layers,
and suckers, ii, 225, 226.
Pruning and training—bushes in open
quarters, ii, 222, Lancashire growers'
method, ii, 223, root-pruning and thin-
ning the fruit, ii, 223, 224, pot-grown
trees (illust.), ii, 224, espalier-trained
and use of fan-mode, ii, 224, arched
trellises, ii, 224, cordon system (illust.),
ii, 225.
Soil and situation, ii, 222; manure, &c., ii,
224, 225.
Storing method, ii, 387.

Gooseberry sawfly—(illust.), description and
treatment, i, 85, 86.

Gordonia pubescens—(illust.), descrip-
tion of, i, 303.

Gorse—description of shrub, i, 324.

Gossypium—species, &c., description and
cult., i, 551.

Gourds, Squashes, or Pumpkins—
(illusts.), description, uses, cult., and list
of sorts, ii, 445, 446, 447; foreign names
of, ii, 527; calendarial directions, ii,
543, 544.

Grafting, Propagation by—
Art of grafting—age and history, i, 236;
explanation of operation (illust.), i, 47,
236-238.

Grafting, Propagation by (cont.)—

- Clay and wax used in—composition of, i, 242.
- Double-grafting and intermediate stocks—introduction of for pear culture, &c., ii, 107.
- Graft and stock—descript. of, i, 236; affinity between, i, 237; modifying influence of stock upon graft, i, 238.
- Grafting by approach (see Inarching).
- Hardy trees and shrubs—effect of grafting on, i, 285.
- Herbaceous grafting—explanations and illustrs., i, 241, 242.
- Improvement of the apple and the pear—results, &c., of systematic treatment, ii, 47, 99.
- Modes of—principle of, i, 236; explanations and illustrs. of modes, i, 239-242.
- Grammatophyllum**—species, &c., descript. and cult., i, 576.
- Grape hyacinth**—(illustr.), descript. and cult., i, 366.
- Grape moth**—(illustr.), descript. and treatment, i, 76.
- Grape scissors**—descript. and use of, i, 180.
- Grape vine**—hardy ornamental species, &c., descript. and cult., i, 326; culture of fruit (see title *Vines*—culture for fruit).
- Grapes**—
- Culture of fruit (see title *Vines*—culture for fruit).
 - Keeping on the vines or when cut—directions and illustrs., ii, 288.
 - Packing—methods of (illustr.), ii, 375, 376; baskets for (illustrs.), ii, 371-373, 380.
 - Storage in grape-room or fruit-room—directions and vars. suitable, Thomery system, &c., ii, 387.
- Grass-cutting machines**—descript. and illustrs., i, 184.
- Grass-edging shears**—(illustr.), descript. and use of, i, 179, 180.
- Grass land** for orchard plantation—question of suitability of, ii, 34.
- Grass of Parnassus**—(illustr.), descript. and cult., i, 369, 386.
- Grass seed** for lawns—selection and method of sowing, i, 278.
- Gravel** for walks in fruit-gardens and plantations—use and cost of, ii, 31, 77.
- Green feather**—descript. of plant, i, 381.
- Green fly**—descript. and treatment, i, 86.
- Green manures**—table showing amount of fertilizing ingredients in garden refuse, &c., i, 156.
- Green plants**—organization and series of, i, 29, 30, 31.
- Greenhouses and Conservatories**—
- Calendarial directions for management of, i, 3, 4, 6, 8, 9, 10, 12, 13, 15, 17, 18, 19.
 - Conservatory management and plants—temperature, shading, decorations, light and artificial light, i, 526; soil and drainage, i, 527; arrangement, list and descript. of plants, i, 527, 528.
 - Construction—general instructions and illustrs. as to lean-to, span-roofed, &c., houses, i, 199, 201, 202, 208; conservatories—illustrs., descript. and forms best suited for, i, 209, 525, 526; greenhouses—forms best suited for, i, 523.
 - Draughts—structures for prevention of, i, 20.
 - Greenhouse management, &c.—use of a greenhouse, explanation of, i, 523; necessity and regulation of light, i, 523; air, temperature, watering, and soil preparation, &c., i, 524, 525.
 - Greenhouse plants—definition of term, i, 523; open-air treatment, i, 525; pruning and training, i, 525; root-pruning, i, 528; list of plants—descripts., illustrs., and cult., i, 528-544; ferns (see that title); temperature, air, &c. (see sub-heading *Greenhouse management*).
 - Heating methods (see *Heating*).

Greenhouses and Conservatories (cont.)—

- Himalayan house at Kew—(illustr.), descript. of, i, 210.
- Greenweed**—descript. of plant, i, 303.
- Grevillea**—calendarial directions, i, 6; species of, descript., and cult., i, 536; *G. robusta* for subtropical garden, i, 644.
- Griffinia**—species, &c., descript. and cult., i, 551.
- Grindstone**—descript. and use of, i, 193.
- Griselina**—species of, descript. and cult., i, 303.
- Ground compasses**—descript. and use of, i, 183.
- Ground hemlock**—descript. of, i, 334.
- Ground lines**—instruments (illustrs.) used in laying-out, i, 181-184.
- Groundsel tree**—descript. of, i, 291.
- Growth and Branching**—
- Buds—formation of (illustr.), i, 46, 47.
 - Conditions necessary to, i, 45.
 - Cuttings—striking of from detached buds, i, 46.
 - Definite and indefinite modes of growth, i, 46.
 - Dorsi-ventral and uniform surfaces, i, 45.
 - Forked, pinnate, and palmate modes of branching, i, 46.
 - Grafting and budding operations, i, 47.
 - Growing-points—formation of, i, 46.
 - Inflorescence and the bracts—descript. of (illustr.), i, 47, 48.
 - Pruning and training—consideration of mode of growth previous to, i, 46.
 - Reproduction and growth, difference between, i, 481.
 - Retarding growth of plants, process of, i, 628.
 - Sympodial and monopodial modes of branching, i, 46.
- Grubbing axe and mattock**—(illustrs.), descript. and uses of, i, 173, 174.
- Gryllotalpa vulgaris**—(illustr.), descript. and remedies, i, 107.
- Guano**—as manure, i, 159, 160.
- Guaves**—orchard-house culture, ii, 275.
- Guelder rose tree**—descript. of, i, 325.
- Guernsey lily**—descript. and cult. of, i, 479, 480.
- Gulls**—as garden friends, i, 117.
- Gum** used in floral decoration—preparation of, i, 648.
- Gumming in fruit, &c.**—cause and treatment, ii, 179, 209.
- Gunnera**—species, &c., descript. and cult., i, 360, 385.
- Gymnocladus canadensis**—descript. of, i, 303.
- Gymnogramme**—stove and greenhouse species, &c., descript., cult., and illustr., i, 594; hardy fern, *G. japonica*, decorative use and descript. of, i, 584, 605.
- Gymnosporangium**—(illustr.), development and treatment, i, 127.
- Gypsophila**—descript. and cult. of perennial species, i, 360, of *G. elegans* as an annual, i, 392.
- Gypsum**—as manure, i, 166.

H

- Habenaria**—species, descript. of, i, 576.
- Hacquetia Epipactis**—descript. and cult., i, 361.
- Hadena oleracea**—(illustr.), descript. and remedies, i, 108, 109.
- Hæmanthus**—descript. and cult. of greenhouse species, &c., i, 536, of stove species, &c., i, 551.
- Hakea**—species of, descript. and cult., i, 536.
- Halesia**—descript. and cult. of *H. tetraptera*, i, 303.
- Halva Wavaria**—(illustr.), descript. and treatment, i, 98.

- Halimodendron argenteum**—descript. and cult., i, 303.
- Haltia consobrina**—(illustr.), descript. and treatment, i, 80.
- Hamamelis**—species, &c., descript., cult., and illustr. of, i, 303.
- Hammer**—(illustr.), descript. and use of, i, 175, 177.
- Hand-glasses**—(illustr.), descript. and use of, i, 195.
- Hardenbergia**—species, &c., descript. and cult., i, 536.
- "Hardy"**—explanation of term as given to any particular plant, i, 283.
- Hardy and half-hardy annuals**—(see *Annals*).
- Hardy Fruit**—
- Calendarial directions (see *Calendar of Operations in the Fruit- and Kitchen-gardens*).
 - Miscellaneous—descript., cult., and illustrs., ii, 251-273.
 - [See also *Strawberries*, *Gooseberries*, *Currants*, &c.]
- Hardy herbaceous plants**—(see titles *Herbaceous Plants*, *Perennials*; also generic names of plants).
- Hardy ornamental trees and shrubs**—(see titles *Hardy Trees and Shrubs*; *Conifers*, *Hardy*; *Sea-side and Town Trees and Shrubs*—for particular tree or shrub, see its generic title).
- Hardy Trees and Shrubs**—
- Choice of for new gardens, &c.—considerations necessary in selection of trees and shrubs, i, 283.
 - Conifers (see that title).
 - Evergreens—effect of wind and temperature on, names of hardest shrubs used as shelter-belts, &c., i, 283, 285.
 - Forcing shrubs—treatment and list of, i, 621-625.
 - Hardiness of various species—question of, and the effect of weather on, i, 283.
 - List of trees and shrubs—descript., illustrs., and cult., i, 286-327; for forcing, i, 621, 625.
 - Sea-side and town trees and shrubs (see that title).
 - Shady places under trees—shrubs suitable for, i, 284.
 - Shrubs in borders or beds—arrangement of, i, 284.
 - Spring-bedding—shrubs suitable for, i, 631.
 - Water-banks, &c.—species suitable for, i, 283, 285.
 - Winter-bedding sorts, i, 646.
 - [See also titles *American Garden*, *Flower-gardens* and *Pleasure-grounds*, *Wild garden*; for particular genus, see its title.]
- Hares**—damage to bark, &c., protection against, i, 70.
- Hare's-foot ferns**—descript. and illustrs., i, 591-593.
- Haricot bean**—(see *Kidney bean*).
- Hart's-tongue ferns**—descript. of, i, 607.
- Hawkflies**—(illustr.), as garden friends, i, 119.
- Hawthorn**—leaf fungus formation (illustr.), i, 127; descript. of trees, i, 298; forcing forms and directions, i, 622.
- Hazel**—ornamental trees and shrubs, descript. of, i, 297.
- Hazel-nut or Filbert**—
- Culture—soil and situation, ii, 254, manure, ii, 254, planting and pruning, ii, 254-256, propagation, ii, 256; calendarial directions, ii, 533, 554.
 - Descript. and history—illustr. of hazel with fruit and flowers, ii, 254.
 - Diseases and insects—treatment of, ii, 256.
 - Flowers—production and descript. (illustr.) of male and female flowers, preservation of catkins, ii, 255.
 - Gathering, storing, and packing the nuts, ii, 256.
 - Lists of best vars. and sorts—descript. and illustr., ii, 257.

Head-dresses, floral—instructions for making, i, 651.

Heat—expansion and closure of parts of a flower and the effect of heat, i, 32; essential to plant nutrition, i, 41, 45; regulation of heat for flower production, i, 49; conveyance of heat, i, 216.

Heaths—calendrical directions, i, 3, 4, 9, 17, 18; hardy ornamental species, &c., description and cult., i, 300; winter-bedding plants, i, 647; popular garden species, &c. (see *Erica*).

Heating Glass-houses, &c., Modes of—Boilers (see that title).

Fern house, i, 583, 585.

Flues—heating by, i, 216.

Furnaces—(illustr.), description and management, i, 217.

Gas—use of, description of gas-stove, i, 222.

Greenhouse and conservatory—gas-stove for small house, illustration and description, i, 222; temperature, warming apparatus for conservatory, i, 524, 526.

Hot water—heating by, i, 216; pipes, construction and length required for warming buildings, i, 216, 221.

Length of piping required to obtain certain temperatures, &c., i, 221, 222.

Orchid houses, i, 559, 560.

Steam—use of and pipes for, i, 222.

Stove or tropical house, i, 544, firing and air-giving, i, 546.

Vineries—hot-water pipes arrangement, i, 206.

Hedera—ornamental vars., &c., description and cult., i, 304; winter-bedding sorts, i, 647.

Hedge bill—description and use of, i, 180.

Hedge mustard—description of, i, 391.

Hedge shears—(illustr.), description and use of, i, 178.

Hedges—(see Fences and Hedges).

Hedychium—calendrical directions, i, 6; description and cult. of hardy perennial plants, i, 361, of semi-aquatic species, i, 381, of greenhouse plants, i, 536, of subtropical garden forms, i, 644.

Hedysarum multijugum—description of, i, 304.

Helenium—calendrical directions, i, 6; species, &c., description and cult., i, 361; *H. pumilum* for summer-bedding, i, 635.

Helianthemum—calendrical directions, i, 16; species, &c., description and cult., i, 304.

Helianthus—calendrical directions, i, 6, 13; perennial species, &c., description and cult., i, 361; annual species, &c., description and cult., i, 392, illustration of miniature form, i, 391; *H. tuberosus* (illustr.), description, uses, and cult. as vegetable, ii, 449, 450.

Helichrysum—description and cult. of *H. macrostemon* as an annual, i, 392; greenhouse sorts, description and cult., i, 536.

Heliconia—description and cult. of, i, 551.

Heliotrope—calendrical directions, i, 2, 4, 10, 12, 15; description and cult. as greenhouse and outdoor plants, i, 536; summer-bedding directions and forms, i, 633, 635.

Heliotropium Peruvianum—as greenhouse and out-of-door plants, i, 536. (See also title *Heliotrope*.)

Helipterum—species, &c., description and cult., i, 392.

Helix hortensis—description and treatment, i, 93.

Helleborus—species, &c., description and cult., i, 361; *H. niger*—calendrical directions, i, 18, illustration and description, i, 361, directions for forcing, i, 625; spring-bedding plants, i, 630.

Hemerocallis—species, &c., description, cult., and illustration of, i, 361.

Hemionitis cordata, H. palmata—description of ferns, i, 594.

Hemitelia—species, &c., description of, i, 594.

Hemlock spruce-tree—description of, i, 335.

Hemp—description and cult. in sub-tropical garden, i, 643.

Hepialus Humuli, H. lupulinus—(illustr.), description and remedies, i, 105, 106.

Heracleum—species, &c., description and cult., i, 361.

Herbaceous border—(see Perennials).

Herbaceous grafting—explanations and illustrations, i, 241, 242.

Herbaceous Plants—

Forcing plants and bulbs—treatment and list of, i, 625–627.

Perennials (see that title).

Winter-bedding—use of hardy plants, i, 646.

Herbs—drying process, ii, 356; packing, ii, 564. (See also names of herbs.)

Hermaphrodite flowers—description of, i, 49, 59.

Herniaria glabra—description and cult., i, 362, for carpet-bedding, i, 639.

Hesperis matronalis fl. pl. and forms of—description and cult., i, 362.

Heterodera radiculicola—(illustr.), description and remedies, i, 105.

Heuchera—species, &c., description and cult., i, 362, for spring-bedding, i, 630.

Hexacentris (Thunbergia) mysorensis—(illustr.), description and cult., i, 551.

Hibbertia—species, &c., description and cult., i, 536.

Hibiscus—hardy ornamental shrub, *H. africanus* major, description of, i, 392; *H. syriacus* and vars., description of, i, 304, for forcing, i, 622; stove species, &c., description and cult., i, 551.

Hickory trees—description of, i, 294.

Hidalgoa Wercklei—(illustr.), description and cult., i, 536.

Himalayan house at Kew—description and illustration of, i, 210.

Hippeastrum—description, history, and illustration of species, &c., i, 447; cultural requirements and treatment of insect pests, i, 447, 448; lists of named hybrids, seedlings, and best species, i, 448.

Hippophæ rhamnoides—description and cult., i, 304.

Hirundo rustica, H. urbica—as garden friends, i, 118.

Hoes—(illustrs.), description and use of Canterbury hoe, i, 174, of draw-hoes and thrust-hoes, i, 175, 176, of Planet Jr. single-wheel hoe, i, 176.

Holly trees and shrubs—calendrical directions, i, 8, 14; transplanting time and mode, i, 248; pruning, i, 256; manure for, i, 275; species, &c.—description and cult., i, 305, 306; winter-bedding vars., i, 647.

Hollyhock—calendrical directions, i, 8, 13, 17, 20; description, history, illustration, cult., propagation, &c., i, 449; fungus disease, i, 449; list of best vars., i, 450.

Honesty—for spring-bedding, i, 630.

Honey locust tree—description of, i, 303.

Honeysuckle—species, &c., description of, i, 308.

Hop—ornamental forms, description of, i, 362; description, uses, and cult. as a vegetable, ii, 446, foreign names of, ii, 527.

Hop-hornbeam—description of, i, 310.

Hoplocampa fulvicornis—description and treatment, i, 77.

Hoplocampa testudinea—description and treatment, i, 74.

Hop-tree—description of, i, 314.

Horehound—description, uses, and cult., ii, 446; foreign names of, ii, 527.

Hornets—as garden friends, i, 120.

Horns and hoofs—as manure, i, 158.

Horse-dung—as manure, i, 161; nitrogen in, analyses table, ii, 464.

Horse-radish—description, illustration, uses, cult., and insect pests, &c., ii, 446–448; foreign names of, ii, 527; calendrical directions, ii, 532, 535, 538, 556.

Horsetail—description of plant, i, 385.

Horticultural tilths—range of, i, 149.

Horticulture, evolution of—influence of hybridism, i, 58.

Hose-pipes—(illustr.), description and use of, i, 185, 186.

Hot-water pipes—heating glass-houses, &c., by means of, i, 216, 221, temperature regulation, i, 222.

Hotela (Spiræa) japonica, &c.—retarding growth of, i, 628.

Hothouses—

Calendrical directions for management of, i, 2, 4, 5, 7, 9, 10, 12, 13, 15, 16, 18, 19.

Construction of—directions and illustration, i, 209, 210.

[See also title *Stove* or *Tropical House*.]

Hottonia palustris—description of, i, 381.

Houlletia—description of orchids, i, 576.

Hour-lines—table of the angles which the hour-lines form with the meridian for every half-degree of latitude, ii, 8.

House-leek—description and cult. of, i, 374, for carpet-bedding, i, 640.

Houstonia—species, &c., description, cult., and illustration of, i, 362.

Houttuynia cordata—description of, i, 385.

Hovea—species of, description and cult., i, 536.

Howea—description and cult. of palms, i, 611.

Hoya—*H. carnosa* for greenhouse, i, 536; stove plants, description and cult., i, 551.

Humata—(see *Davallia*).

Humea elegans—description of plants, i, 537, for summer-bedding (illustr.), i, 635.

Humulus—description of *H. lupulus*, i, 362, cult., uses, &c., as vegetable, ii, 446; *H. japonicus*, description and cult. of, i, 392.

Humus or Vegetable Mould—

Assimilable elements in one hectolitre of sifted leaf-mould—table showing weight of, i, 137.

Description and formation of, i, 131, 136, 138.

Direct absorption of humus of the soil by growing plant—question of, i, 139.

Elements not present in—means of applying to the soil, i, 137, 138.

Importance of as a source of the nitrogen of crops, i, 136.

Influence of humus on capacity of soil for water, i, 135.

Kinds of leaf-mould—description of, i, 136, 137.

Plant-food—humus as a source of, i, 134.

Retentive properties of leaf-mould for manurial substances, i, 137.

Selected constituents in parts per 100 of mould—table showing amount of, i, 137.

[See also *Soils*, sub-heading *Horticulture*.]

Hyacinth—calendrical directions, i, 3, 6, 14, 17, 18, 19, 20; description and cult. of hardy perennial species, &c., i, 362, of grape hyacinth (illustr.), i, 366, of water hyacinth (illustr.), i, 383; forcing sorts and directions, i, 626; spring-bedding sorts and directions, i, 630; popular garden forms (see *Hyacinthus orientalis*).

Hyacinthus—species, &c., description and cult., i, 362. (See also titles *Hyacinth*, *Hyacinthus orientalis*.)

Hyacinthus orientalis—popular garden forms—description, history, Dutch and English trade, i, 450; propagation, cult. in beds, pots, glasses, i, 450–452; illustration of single and double hyacinths and of bulb with offsets, i, 450, 451; list of best vars., i, 452.

Hyalopisteris Pruni—description and treatment, i, 89.

Hybernia defoliaria—(illustr.), description and treatment, i, 87.

Hybridization—

Authors' references to—history of experiments, &c., i, 58.

Chief factors in plant improvement, i, 59.

Cross-breeding—course of procedure, i, 55.

Cryptogamic or flowerless plants, i, 64.

Difference between cross-fertilization and hybridization, i, 55.

Hybridization (cont.)—

- Double flowers—production of (illust.), i, 63.
- Evolution of horticulture—influence of hybridism, i, 58.
- Examples of hybrid plants in wild state and as raised by cross-fertilization (illust.), i, 61.
- Ferns—treatment of, i, 64.
- Improvements due to judicious treatment, i, 58; extracts from reports on apple and pear culture, ii, 48, 101; plums, illusts. of hybrid forms, &c., ii, 151-153.
- Isolation and self-fertilization to fix varieties, i, 62.
- Orchids—mode of procedure for crossing and hybridization (illust.); description of wild hybrid forms, i, 61, 62.
- Process of—explanation and directions for dealing with various types of flowers, i, 55, 59, 60; emasculation of anthers, i, 60; appliances and details for practical work, i, 60.
- Sports or bud-variations, appearance and origin of, i, 55, 65.
- Hybrids**—description, and examples (illusts.), i, 55, 61.
- Hydrangea**—calendrical directions, i, 5, 8, 12, 14; pruning *H. paniculata*, i, 256; hardy species, &c., description, cult., and illusts., i, 304, 305; *H. Hortensis* as greenhouse plant, i, 537; forcing forms and directions, i, 622.
- Hydrogen**—combination with free nitrogen and the formation of ammonia, i, 143.
- Hylemyia nigrescens**—description, and remedies, i, 112.
- Hylotoma**—(illust.), description, and treatment, i, 91.
- Hymenanthera crassifolia**—(illust.), description, and cult., i, 305.
- Hymenocallis**—species, &c., description, and cult., i, 551.
- Hymenophyllum**—stove and greenhouse species, &c., description, and cult., i, 594, 595; hardy ferns, description, and cult., i, 605.
- Hyophorbe**—species of, description, and cult., i, 611.
- Hypericum**—description, and cult. of hardy ornamental species, &c., i, 305, of hardy herbaceous perennials, i, 362; forcing kinds and directions, i, 623; summer-bedding sorts, i, 632.
- Hypocotyl**—formation (illust.) and use of, i, 34, 35.
- Hypolepis**—species, &c., description, and cult., i, 595.
- Hyponomeuta Padellus**—(illust.), description, and treatment, i, 94, 95.
- Hyssop**—description, uses, and cult., ii, 448; foreign names of, ii, 527; calendrical directions, ii, 535, 541.
- Hyssopus officinalis**—(see Hyssop).

I

- Iberis**—calendrical directions, i, 16; description, and cult. of perennial species, &c., i, 362, of annual species, i, 392.
- Ice-house**—(illust.), construction and management of, i, 215, 216.
- Iceland poppy**—description, of, i, 368.
- Ichneumon flies**—(illust.), as garden friends, i, 120, 121.
- Idesia polycarpa**—description, of, i, 305.
- Ilex**—species, &c., description, cult., and illust., i, 305, 306; winter-bedding vars., i, 647.
- Impatiens**—hardy annuals, description, cult., and illust., i, 392, for summer-bedding, i, 635; stove species, &c., description, and cult., i, 531.
- Implements** used in gardens—(see Tools).
- Inarching, propagation of**—directions and illusts., i, 245-247.
- Incarvillea**—species, &c., description, cult., and illust., i, 362, 363.

- Incurvaria capitella**—(illust.), description, and remedies, i, 113.
- India-rubber plants**—description, and cult., i, 550.
- Indian bean tree**—description, of, i, 294.
- Indian corn**—description, illust., uses as table vegetable and field crop, directions for cooking, cult. in America and England, &c., ii, 448, 449; foreign names of, ii, 527.
- Indian cress**—(see Nasturtium).
- Indian fig plant**—description, and cult., i, 620.
- Indian pink**—(illust.), description, and cult., i, 374, 391.
- Indigofera Gerardiana**—description, of, i, 305.
- "Individual plant"**—botanical meaning of term, i, 66.
- Inflorescence**—growth of (illust.), i, 47.
- Insect Agency on Formation and Life of Plants**—
- Contraction of leaf of insectivorous plant caused by contact of insects (illust.), i, 31.
- Conveyance of pollen by insects and parts of flowers adapted for access of insects (illust.), i, 51, 54, 59.
- Insect and other Plant Enemies**—
- Bark enemies—description. (illusts.) and remedies, i, 67-71.
- "Biting" and "sucking" insects—description, of groups, ii, 43.
- Bud and flower enemies—description. (illusts.) and remedies, i, 71-74.
- Conifers, hardy—description, and treatment of insect pests on, i, 328.
- Fruit and seed enemies—description. (illusts.) and remedies, i, 74-79.
- Leaf enemies—description. (illusts.) and remedies, i, 79-99.
- Protectors against slugs—pots, &c., for (illust.), i, 191, 192.
- Root enemies—description. (illusts.) and remedies, i, 99-112.
- Sprayers for distribution of insecticides, &c.—illusts. and use of, i, 188; ii, 40-42.
- Spraying fruit-trees (see that title).
- Stem borers—description. (illusts.) and remedies, i, 112-114.
- [For special insect or pest, see its title; for insect pests, &c., of particular plant, fruit, or vegetable, see name of plant, fruit, &c.]
- Insect garden friends**—(illusts.), description, and uses of, i, 114-122. (For special insect, see its name.)
- Insecticides**—sprayers for distribution of (illust.), i, 188, ii, 40-42; application of on fruit-trees, ii, 42, 43. (For remedy of special insect pest, &c., see name of insect.)
- Instruments**—
- Garden tools, &c. (see title Tools and Instruments; special instrument, see its name).
- Meteorological—(illust.), description, management, and prices, i, 21-25.
- Intermediate house**—calendrical directions for management of, i, 2, 4, 6, 7, 9, 10, 12.
- Inula**—species, &c., description, and cult., i, 362.
- Iochroma**—species, &c., description, and cult., i, 537.
- Ipomoea**—description, and cult. of annual species, &c., i, 392, of stove plants, i, 551.
- Iresine**—calendrical directions, i, 15; summer-bedding directions, i, 633, 635.
- Iris**—marsh plants, description, cult., and illust., i, 385, 386; popular garden plants—description, and division of genus into sections, i, 452, authorities on culture, i, 452, illusts. of garden at Kew and of flag and Spanish irises, i, 452, cultural systems and lists of best vars. (illusts.) of each section, i, 452-456; forcing sorts and directions, i, 626.

- Iron** essential to formation of the chlorophyll of plants, i, 43.
- Iron sulphate solution**—as a fungicide, i, 130.
- Isolation and self-fertilization of plants to fix varieties**, i, 62.
- Isoloma**, **Tydaea**, and **Nægelia**—confusion of genera in gardens, i, 456, description, cult., and lists of vars., i, 456, 457, illust. of *Nægelia*, i, 457.
- Isosoma orchidearum** or **I. Cattleyæ**—description, and treatment, i, 102.
- Isotoma axillaris**—for summer-bedding, i, 635.
- Itea virginica**—description, and cult., i, 306, forcing directions, i, 623.
- Ivy**—influence of light on growth, i, 32; covering for arbours, &c., i, 276; description, and cult. of vars., &c., i, 304, Cape ivy (illust.), i, 542, winter-bedding forms, i, 647.
- Ixia**—calendrical directions, i, 19; description, and cult. of, i, 537.
- Ixiolirion**—species, &c., description, and cult., i, 362.
- Ixora**—calendrical directions, i, 4, 7, 10, 15; description, and cult. of, i, 552.

J

- Jackdaw**—as garden friend, i, 117.
- Jacobæa elegans**—(see Senecio).
- Jacobinia**—species, &c., description, and cult., i, 552.
- Jacob's ladder**—description, and cult., i, 370.
- Jacquemontia violacea**—as a stove plant, i, 552.
- Jam-making**—extent of industry, ii, 344, fruit suitable, directions, appliances (illusts.) and essentials for making jam, ii, 346-348, 358; routine work in a factory, ii, 346, 347; packing and storing jam, ii, 348.
- Jamesia americana**—description, of, i, 306.
- Japanese cedar**—(illust.), description, of, i, 329.
- Japanese hops**—description, and cult., i, 392.
- Japanese maples**—description, and cult., i, 529.
- Japanese persimmon**—(see Date plum).
- Japanese plums**—(see title Plums and Damsons).
- Japanese water iris**—description, and illust., i, 385, 386, cult., &c., i, 452, 454.
- Japanese winberry**—description, of, i, 319.
- Jasione**—species, description, and cult., i, 363.
- Jasmine**—(see Jasminum).
- Jasminum**—calendrical directions, i, 11, 15; description, and cult. of hardy species, &c., i, 306, of greenhouse shrubs, i, 537, of stove shrubs (illust.), i, 552, of *J. nudiflorum* for forcing, i, 623.
- Jelly-making**—fruit suitable, directions and appliances for, ii, 349, 350.
- Jerusalem artichoke**—(illust.), description, uses, directions for cooking and cult., ii, 449, 450; foreign names of, ii, 527; calendrical directions, ii, 532, 538, 558; packing, ii, 561.
- Jerusalem sage**—description, of, i, 312.
- Joss lily**—cult. of, i, 472.
- Judas-tree**—description, of, i, 295.
- Juglans**—hardy ornamental species, &c., description, of, i, 306; cult. of *J. regia* (illust.) for fruit, ii, 257.
- Julus guttatus**, **J. terrestris**, and **J. londinensis**—(illusts.), description, and remedies, i, 106.
- Juncus spiralis**, **J. zebrinus**—description, and cult., i, 386.
- June-berry**—description, of, i, 288.
- Juniper-tree**—formation of gymnosporangium on branch of (illust.), i, 127. (See also Juniperus.)
- Juniperus**—species, &c., description, and cult., i, 330, 331, for winter-bedding, i, 647.
- Jussiaea grandiflora**—description, of, i, 381.

K

- Kadsura japonica**—descript. of, i, 306.
Kæmpferia—descript. and cult. of, i, 552.
Kaffir bread—descript. of cycad, i, 615.
Kaki—(see Date plum).
Kalanchoë—species, &c., descript. and cult., i, 619.
Kale—(see Borecole); sea-kale (see that title).
Kalmia—calendrical directions, i, 8; hardy species, &c., descript. of, i, 306; forcing sorts and directions, i, 623.
Kangaroo apple—descript. and cult. of plant, i, 542.
Kangaroo vine—descript. and cult., i, 544.
Karatæ—species, &c., descript. and cult., i, 552.
Kaulfussia amelloides—descript. and cult., i, 393.
Kennedy—calendrical directions, i, 11; descript. and cult., i, 537.
Kentia—calendrical directions, i, 2; species of descript., and illust. i, 611. (See also Howea.)
Kentucky coffee tree—descript. of, i, 303.
Kerria japonica and vars.—descript. of, i, 306; directions for forcing, i, 623.
Kidney bean—
 Calendrical directions, ii, 541, 543, 546, 548; for forcing, ii, 533, 536, 539, 542, 552, 554, 556, 559.
 Crops kidney beans may follow and be succeeded by, ii, 390.
 Descript., illust., uses, and history of cult., ii, 450.
 Disease and insect pests—French bean canker (illust.), i, 129; red spider, &c., ii, 452.
 Forcing methods and vars., ii, 451, 452.
 Foreign names of, ii, 528.
 Gathering the crop, ii, 451.
 Lists (illusts.) of sorts, ii, 452-454.
 Packing, ii, 562.
 Preserving process, ii, 356.
 Sowing seeds—directions, ii, 451.
 Soil, situation, and manure, ii, 450.
 Sowing—seed quantities, ii, 391; time, method, and subsequent cult. of plants, ii, 451.
Killarney fern—descript. and cult., i, 608.
Kitchen-garden—
 Calendar of Operations in the Fruit- and Kitchen-gardens (see that title).
 Cropping—necessity and rules for systems of rotation, merits of modes of cropping, ii, 389, 390; list of crops to follow each other, ii, 390, 391; quantities of seed required, ii, 391.
 Formation of (see title Fruit- and Kitchen-garden).
 Soil—amounts of nitrogen and organic matter in, i, 150. (See also Soils.)
 [See also title Vegetables; for special vegetable, see its name.]
Kleinia—species, &c., descript. and cult., i, 619, for carpet-bedding, i, 639.
Kniphofia Tritoma—cult. and descriptive list (illusts.) of species, &c., i, 457, 458, names of best hybrids and seedlings, i, 459.
Knives—descript. and uses of budding, pruning, and propagating (illust.) knives, i, 178, asparagus knife (illust.), i, 179, 181.
Kochia scoparia—descript. and cult., i, 644.
Kœlreuteria paniculata—descript. of, i, 306.
Kohl Rabi—descript., illust., uses, and cult., ii, 454; foreign names of, ii, 528; packing, ii, 564.

L

Labels—(illust.), descript. and uses of, i, 194, 195; ii, 368.

- Laburnum**—descript. of forms of, i, 306; forcing directions, i, 623.
Lacewing flies—(illust.), as garden friends, i, 120.
Lachenalia—descript., cult., list, and illusts. of good garden plants, i, 459, 460.
Lackey moth—(illust.), descript. and treatment, i, 86.
Lactuca—ornamental perennials, descript. and cult., i, 363.
Lactuca sativa—descript. of, ii, 457; cult. (see Lettuce).
Ladders for garden use—illust. and descript., i, 193, 194.
Lady-birds—(illust.), as garden friends, i, 116.
Lady fern—descript. of, i, 605.
Lady's smock—descript. and cult., i, 353.
Lælia—calendrical directions, i, 4, 5, 11, 15, 18, 19; native habitats of, i, 557; illusts. of, i, 568, 576; cultural requirements, i, 561, 563, 565, 566, 568, 576; insect pests, i, 568; species, &c., descript. of, i, 576.
Lælio-Cattleya—descript. of hybrid orchids, i, 576, 577.
Lagerstroemia—descript. and cult. of greenhouse plants, i, 537, of stove plants (illust.), i, 552.
Lakes, artificial and natural—(see Ornamental Water).
Lamb's lettuce—(see Corn salad).
Lampronia Rubiella—(illust.), descript. and treatment, i, 73.
Lampyrus noctiluca—as a garden friend, i, 115.
Land tenure and the establishment of orchards for commercial purposes, ii, 75.
Lantana—descript. and cult. as greenhouse plants, i, 537; for summer-bedding, i, 635.
Lapageria—calendrical directions, i, 4, 11; descript. and cult. of *L. rosea* as hardy shrub, i, 307, as greenhouse plant, i, 537.
Lapwing—as garden friend, i, 117.
Larch-trees—insect pests, i, 328; descript. of species, &c., i, 331, of golden larch, i, 332.
Lardizabala bitermata—descript. of, i, 307.
Larix—insect pest, i, 328; descript. of species, &c., i, 331, of golden larch, i, 332.
Larkspurs—descript. and cult. of annual, i, 391.
Larus canus, L. ridibundus—as garden friends, i, 117.
Lastrea—(see Nephrodium).
Latania—species, &c., descript. and cult., i, 611.
Lathyrus—hardy perennial species, descript., cult., and illust., i, 363; annual forms—descript. and cult., history and illust. of, i, 393; *L. splendens* for greenhouse, i, 537; *L. odoratus* for summer-bedding, i, 635.
Latitude and the table of angles which the hour-lines form with the meridian, ii, 8.
Laurel—calendrical directions, i, 14; pruning, i, 256; descript. of *Cerasus* species, i, 294, of wood-laurel, i, 299, of sheep-laurel, i, 306, of Alexandrian laurel, i, 320.
Laurus Benzoin, L. nobilis, L. Sassafras—descript. of, i, 307.
Laurustinus—(see Viburnum).
Lavandula—species, &c., descript., cult., and uses, i, 307, ii, 455.
Lavatera trimestris—descript. and cult. of, i, 393.
Lavender—descript., cult., and uses of, i, 307, ii, 455, 541; foreign names of, ii, 528.
Lawn-mowers—various makes, descript. and illusts., i, 184, 185; carriage for (illust.), i, 185.
Lawn-sprinklers—(illust.), descript. and use of, i, 186.

- Lawn-tennis grounds**—formation and care of, i, 280.
Lawns—
 Bowling-grounds and lawn-tennis grounds (see those titles).
 Formation of—drainage, levelling, turf-laying, and seed-sowing, i, 277-279.
 Keeping in order—manures, &c., suitable, i, 279; mowers (see title Lawn-mowers).
 Mossy—treatment of, i, 279.
 Seed suitable for and mode of sowing, i, 278.
 Trees suitable for planting on—conifer species, i, 327, 328.
Layers, propagation by—directions for various methods (illust.), i, 229-231.
Layia (Oxyura) chrysanthemoides (elegans)—descript. of, i, 393.
Lead plant—descript. of, i, 288.
Leaf—forms and structure (illusts.), i, 37-40; functions and uses of, i, 39-41; nutrition of plant, i, 44; movement of liquids in, i, 44; growth of bracts, i, 48. (See also Leaves.)
Leaf-buds—(see Buds).
Leaf disease in cherries in Kent and elsewhere—appearance and treatment, ii, 210.
Leaf enemies—descript. (illusts.) and treatment of insect and other pests, i, 79-99.
Leaf-mould—
 Azalea culture—composition of mould suitable for, i, 151-154.
 Flower-garden soil—preparation and use of leaf-mould, i, 141, 260, 261.
 Kinds of leaf-mould—descript. of, i, 136, 137.
 Manurial uses, i, 155.
 Nitrogen and organic matter in—table showing amounts of, i, 150.
 [See also titles Humus, Soils—sub-heading Horticulture.]
Leaves—manurial uses of, i, 155; propagation by, i, 235; forms of, &c. (see Leaf).
Lecanium hesperidum, L. hibernaculorum—descript. and treatment, i, 92.
Lecanium Persicæ—descript. and treatment, i, 69.
Ledum—species, &c., descript. of, i, 307.
Leea—species of, descript. and cult., i, 552.
Leeks—crops leeks may follow and be succeeded by, ii, 390; seed quantities, ii, 397; descript., illust., cult., list of vars., ii, 455, 456; foreign names, ii, 528; calendrical directions, ii, 535, 538, 541, 543, 546, 548, 552; packing, ii, 564.
Leguminosæ plants—descript. of, i, 56; sources of nitrogen of crops, i, 142-146.
Lemon-scented Verbena—descript. of, i, 307.
Lemons—(see title Oranges, Lemons, &c.).
Lenten roses—descript. and cult. for spring-bedding, i, 630.
Lentil—descript., illust., uses, and cult., ii, 456; foreign names of, ii, 528.
Leontopodium—descript. and cult. of *L. alpinum*, i, 363.
Lepidium sativum—descript. and cult., ii, 440.
Leptosiphon—species, &c., descript. and cult., i, 393.
Leptospermum—species, &c., descript., cult., and illust. of, i, 537.
Leptosyne calliopsidea and other annual forms—descript. and cult., i, 393.
Lespedeza bicolor—descript. of, i, 307.
Lettuce—
 Calendrical directions, ii, 532, 535, 538, 541, 543, 546, 548, 550, 552, 554, 556; for forcing, ii, 533, 537, 539, 542, 556, 559.
 Crops lettuce may follow and be succeeded by, ii, 390.
 Forcing methods and sorts, ii, 459.
 Foreign names of, ii, 528.
 General culture—preparation of seed-bed or open border, soil, &c., planting-out and subsequent treatment, successional sowings, &c., ii, 457-459.

Lettuce (*cont.*)—

Insect pests, &c.—list of, ii, 460.
Lamb's lettuce (see Corn salad).
Lists (illustrs.) of vars. of cabbage and cos
lettuces, ii, 460, 461.

Packing, ii, 564.

Saving seeds—directions, ii, 460.

Seed quantities for cropping, ii, 391.

Lettuce fly—descript. and treatment, i, 77.

Lettuce-root aphid—descript. and treatment, i, 106.

Leucogium—species, &c., descript. and cult.,

i, 363; for spring-bedding (illustr.), i, 630.

Leucophyton Browii—for carpet-bedding,

i, 639.

Leucothoe—descript. of *L. Catesbaei*, *L.*
racemosa, &c., i, 307.

Levelling—

Directions and diagrams for levelling a line
to edge a walk or strip of border, ii,
12–16, for ascertaining proper average
level of whole ground, ii, 16.

General remarks—effect of work done by
chance, &c., ii, 11, 12, 17.

Instruments in use—descript. and illustrs.,
i, 183, 184; ii, 12, 16, 17.

Pleasure-grounds—walks and ground, i, 269.

Slopes and undulating ground—methods of
dealing with (illustr.), ii, 17, 18.

Levels—(illustr.), descript. and use of, i, 183,
184; ii, 12, 16, 17.

Lewisia—species, &c., descript. and cult.,
i, 363.

Leycesteria formosa—descript. of, i, 307.

Liatris—species, &c., descript. and cult.,
i, 363, 364.

Libertia formosa and *L. ixioides*—as
greenhouse plants, i, 537.

Libocedrus—descript. of, i, 331.

Licuala—species of, descript. and cult., i,
611.

Light—

Artificial in conservatory, arrangements
suitable, i, 526.

Influence on plants, i, 32, 41, 44, on flower-
production, i, 49.

Necessity to vegetable life—plants under
glass, i, 523, 526.

Ligustrum—species, &c., descript., cult.,
and illustr. of, i, 307; for winter-bedding,
i, 647.

Lilac—calendarial directions, i, 3, 18; species,
&c., descript., cult., and illustrs., i, 323;
forcing directions and forms (illustr.),
i, 621, 624, 625.

Lilies—(see *Lilium*; for special lily, see its
name, as *Joss lily*, *St. Bruno's lily*, &c.).

Lilium—

Calendarial directions, i, 3, 9, 14, 17, 18.
Commercial value of—extent of trade in
bulbs, &c., i, 466.

Extent of the genus, i, 460; quotations and
lists from "A Conspectus of the Genus
Lilium" by Prof. Waugh, i, 460, 461.

Forcing—directions and species suitable, i,
626.

General culture—position, soil, time and
method of planting, &c., i, 461–463;
Kew system, i, 463, 464; propagation,
i, 464; cult. of *L. giganteum*, i, 464;
pot-plants under glass, i, 465; improve-
ments by hybridization and new lilies
introduced, i, 465.

Illustrs.—*Lilium auratum*, i, 461, *L. Browni*,
i, 462, *L. giganteum*, i, 463, *L. speciosum*,
i, 464, bulb proliferation of *L.*
pardalinum, i, 465, *L. Dahlhansonii*, i,
466, *L. longiflorum* Wilsoni, i, 467, *L.*
nepalense, *L. Parryi*, i, 468, *L. sul-*
phureum, i, 469.

Lists of species and vars.—sub-genus list
by Prof. Waugh, i, 460, 461; pot-plants
for under glass, i, 465; new hybrids,
&c., i, 465; general list (illustrs.), i,
466–469.

Peaty places—species suitable for, i, 386.

Retarding growth of—treatment, i, 628.

Root-action, species differing in—treat-
ment of, i, 462, 463.

Lilium (*cont.*)—

Summer-bedding—species and directions
for, i, 635.

Lily of the Valley—calendarial directions,
i, 3, 17, 18; descript. and cult., i, 354;
forcing, i, 626; retarding growth of,
i, 628.

Lily of the Valley tree—descript. and
cult., i, 533.

Limax ater, *L. agrestis*—descript. and
treatment, i, 93.

Lime—manurial uses of sulphate of, phos-
phate of, quicklime, &c., i, 164–166.

Lime-trees—hardy ornamental species, &c.,
descript. and cult., i, 323, 324; fruit
culture (see title *Oranges*, *Lemons*,
&c.).

Limestone gravel—as a manure, i, 167.

Limnanthes Douglasii—calendarial direc-
tions, i, 14; descript. and cult., i, 393.

Limncharis Humboldtii—(illustr.), de-
script. and cult., i, 381.

Linaria—descript. and cult. of hardy peren-
nial species, &c., i, 364, of hardy
annuals, i, 393.

Lindelophia spectabilis—descript. and
cult., i, 364.

Lindsaya—descript. of ferns, i, 595.

Line and reel for garden use—descript. of,
i, 181.

Linnæa borealis—descript. and cult., i,
307, 364.

Linnæan nomenclature system—i, 67.

Linospadix—species of, descript., cult.,
and illustr. of, i, 611, 612.

Linum—calendarial directions, i, 6, 12;
descript. and cult. of hardy perennial
species, &c., i, 364, of hardy annuals
(illustr.), i, 393, 394.

Lippia citriodora—descript. of, i, 307, as
a greenhouse plant, i, 537.

Liqueurs made from fruit and fruit-juices,
ii, 203, 364.

Liquid manure—use of, i, 161.

Liquidambar—species of, descript., i, 307.

Liquids in plants—movement of, i, 44.

Liquorice—descript., illustr., uses, and cult.,
ii, 461; foreign names of, ii, 528.

Liriodendron tulipifera—descript. of, i,
307.

Lithobius forficatus—descript. and treat-
ment, i, 106.

Lithospermum—calendarial directions, i,
16; species, &c., descript. and cult.,
i, 364.

Litobrochia—(see *Pteris*).

Litter used for bedding animals—effect on
value of manure, i, 160.

Livistona—species, &c., descript. and cult.,
i, 611; for subtropical garden, i, 644.

Lizards—as garden friends, i, 119.

Loasa lateritia (*L. aurantiaca*)—de-
script. and cult. of, i, 394.

Lobelia—calendarial directions, i, 3, 17;
descript. and cult. of perennial species,
&c., i, 364, of *L. cardinalis* as marsh
plant, i, 386, of annual *L. Erinus*, &c.,
i, 394; summer-bedding forms (illustr.)
and directions, i, 635, 636.

Logan herry—(illustr.), descript., origin,
and cult. of, ii, 270, 271.

Loiseleuria procumbens—descript. of,
i, 308.

Lomaria—descript. of decorative ferns, i,
584, of stove and greenhouse species,
&c., i, 595, of hardy species *L. alpina*,
&c., i, 606, of cycad *L. eriopus*, i, 613.

London plane-tree—descript. of, i, 313.

London purple insecticide—use of, ii, 43.

Lonicera—hardy ornamental species, &c.,
descript., cult., and illustr. of, i, 308;
greenhouse species, i, 537; forcing
forms, i, 623.

Lopping shears—(illustr.), descript. and
uses of, i, 178.

Loquat tree—descript. and cult., i, 535.

Loropetalum chinense—descript. of, i,
308.

Lotus Bertholetii (*peliorhynchus*)—
as a greenhouse plant, i, 537.

Love apple—(see *Tomato*).

Love-in-a-mist—(illustr.), descript. and
cult., i, 396.

Love-lies-bleeding—descript. and cult.,
i, 389.

Lozotænia Rosana—descript. and treat-
ment, i, 92.

Luculia gratissima (illustr.) and *L. Pin-*
ceana—as greenhouse plants, i, 538.

Lumbricus terrestris—as garden friend,
i, 119.

Lunar-spotted pinion moth—descript.
and treatment, i, 86.

Lunaria—calendarial directions, i, 11; *L.*
biennis variegata for spring-bedding,
i, 630.

Lungwort—descript. and cult. of, i, 371.

Luperus betulinus—descript. and treat-
ment, i, 89.

Lupinus—descript. and cult. of perennial
species, &c. (illustr.), i, 364, of annual
species, &c., i, 394.

Lycaste—calendarial directions, i, 5, 13;
descript. and cult. of, i, 577.

Lychnis—species, &c., descript., cult., and
illustr. of, i, 364.

Lychnis viscaria and *L. fulgens* as
annuals—descript. and cult., i, 394.

Lycium—species, &c., descript. and cult.,
i, 308.

Lycopersicum esculentum—origin and
extent of cultivation, ii, 330.

Lycopodium, common—descript. of, i,
602.

Lycopodiums—descript., cult., and illustr.
of, i, 603.

Lycoris—descript., cult., and illustr. of hardy
perennial species, &c., i, 364, 365;
greenhouse plants, i, 538.

Lyda inanita—descript. and treatment, i,
91.

Lygodium—species, &c., descript. and
illustr., i, 595, 596.

Lyonetia Clerckella—(illustr.), descript.
and treatment, i, 88.

Lyonia ferruginea—descript. and cult. of,
i, 308.

Lysimachia Nummularia aurea—for
carpet-bedding, i, 639.

Lythrum (*Loosestrife*)—descript. and
cult., i, 364.

M

Mace reed—descript. of, i, 384.

Machinery (illustr.) used in cold-storage of
fruit, &c., i, 388.

Machines—descript. and illustrs. of lawn-
mowers, water-barrows, &c., i, 184–190;
transplanting machines, i, 249–251;
spraying appliances, ii, 40–42; fruit-
drying, &c. (see *Drying or Evaporating*
Fruit).

Macleania—descript. and cult. of, i, 538.

Maclura aurantiaca—descript. of, i, 318.

Macrosporium Lycopersici—treatment
of, ii, 341.

Macrosporium Solani—cause of "Curl"
disease in potatoes, ii, 498.

Macrosporium Tomato—treatment of, ii,
341.

Macrotomia—descript. and cult. of *M.*
echioides, i, 364.

Macrozamia—species, &c., descript. and
cult., i, 613, 614, 615.

Magnesia—manurial uses of, i, 167.

Magnolia—calendarial directions, i, 3; de-
script. and cult. of hardy ornamental
species (illustrs.), i, 308, 309, of green-
house species, i, 538, of forcing plants,
i, 623.

Magpie—as garden friend, i, 117.

Magpie moth—(illustr.), descript. and treat-
ment, i, 87.

Malanthemum bifolium—descript. and
cult., i, 364.

Maiden-hair tree—descript. of, i, 330.
Maiden's wreath—descript. and cult. of, i, 359.
Maize—use and cult. in subtropical garden, i, 646; packing, ii, 565. (See also Indian corn.)
Malcolmia maritima—descript. and cult., i, 394.
Male fern—descript. and cult. of, i, 606.
Mallet—descript. and use of, i, 178.
Malope trifida—descript. of, i, 395.
Malt-dust—as a manure, i, 156.
Malva—species, &c., descript. and cult., i, 365.
Mamestra Brassicae—(illust.), descript. and treatment, i, 82.
Mamillaria—species, &c., descript. and cult. i, 619.
Mammoth tree—descript. and size of, i, 333.
Mandevilla suaveolens—as a greenhouse plant, i, 538.
Manettia—species, &c., descript. and cult., i, 552.
Mangel-wurzel—effect of mineral and nitrogenous manure on crops, i, 144, 145.
Manures—
 Artificial (see sub-heading Inorganic).
 Calendrical directions for Flower, Fruit, and Kitchen-gardens (see titles Calendar of Operations in the Flower-garden, &c.).
 Choice of for various soils—general remarks, i, 154.
 Effect of manures—
 Conditions influencing, i, 154.
 Experiments with different manurial applications on peach-trees, tomatoes, strawberries, potatoes, i, 171, 172.
 Nitrogenous—effect on nutrition of plants and crops, i, 42, 43, 144-146.
 Potash—influence on vegetable physiology, i, 169, 170.
 Fruit- and kitchen-garden and orchards—manures suitable for, ii, 28, 30, 35, 39.
 General and special—description of, i, 154.
 Inorganic (mineral origin), i, 154.
 Ammonia as a component of, i, 167, 168.
 Ashes of coal, of peat, of wood, of burned clay, i, 163.
 Chalk, i, 165.
 Charcoal as an auxiliary, i, 165.
 Coprolites, i, 166.
 Gas waste, i, 164.
 Lime—quicklime, sulphate of, phosphate of, i, 164-166.
 Limestone gravel, i, 167.
 Magnesia, i, 167.
 Marls—varieties of, i, 166, 167.
 Potash—valuable constituent of manure, i, 168, 169; nitrate of potash, i, 170.
 Sands—calcareous, i, 167.
 Soda—nitrate of, i, 170.
 Litter used for bedding animals—effect on value of, i, 160.
 Nitrogen in various dungs used for mushroom culture, analyses table, ii, 464.
 Organic (vegetable and animal origin), i, 154, 155.
 Blood, i, 157.
 Bones, i, 158.
 Composts, i, 162.
 Cow-dung, i, 161.
 Decomposition of vegetable and animal substances, i, 155.
 Differences in dungs—causes affecting, i, 160.
 Farmyard, i, 156, 160, 162.
 Fish guanos, i, 157, 158.
 Green manures, table showing amount of fertilizing ingredients in garden refuse, &c., i, 156.
 Guanos—Bats' or Texas, &c., i, 159, 160.
 Horns and hoofs, i, 158.
 Horse-dung, i, 161.

Manures (cont.)—
Organic (cont.)—
 Leaves, i, 155.
 Liquid, i, 161.
 Malt-dust, i, 156.
 Night-soil, i, 158.
 Peat, i, 155.
 Pig's-dung, i, 162.
 Poudrette, i, 159.
 Poultry dung, i, 160.
 Rape-dust, i, 156.
 Sea-weeds, i, 156.
 Sewage, i, 159.
 Soot, i, 157.
 Urine, i, 160.
 Woollen refuse and shoddy, i, 158.
 [Manure for special fruits or flowers, see titles Vines, Orchids, &c.]
Maple-trees—species, &c., descript. and cult., i, 286, 287, Japanese maples, i, 529.
Maranta—calendrical directions, i, 5; descript. and cult., i, 552.
Marogravia—species, &c., descript. and cult., i, 553.
Marguerite—calendrical directions, i, 5, 11, 14; forcing directions, i, 626.
Marica—as stove plants, i, 553.
Marigold—descript. and cult. of marsh-marigold, i, 352, pot-marigold, i, 389, annual types (illust.), i, 399, fig-marigold, i, 395; summer-bedding kinds and directions, i, 627; descript., uses, and cult. as vegetable, ii, 462; foreign names of, ii, 528.
Marjoram—descript., uses, and cult. of species, ii, 462; foreign names of, ii, 528; calendrical directions, ii, 539, 541, 543.
Market-gardening—(see titles Apples, &c., for Market, Pears for Market).
Marl—as a manure, i, 166, 167.
Marmalade—orange and quince, directions for making and demand for, ii, 359, 360.
Marrubium vulgare—descript., uses, and cult., ii, 446.
Marsh-marigold—descript. of, i, 352.
Marsh plants—(see title Aquatic and Bog Plants; for particular plants, see generic titles).
Martinezia caryotæfolia—descript. and cult. of, i, 612.
Marvel of Peru—descript. and cult., i, 395.
Masdevallia—calendrical directions, i, 7, 18; species, &c., descript., cult., and illusts., i, 577.
Matthiola—annual forms, &c., descript., cult., and illusts., i, 394, 395; summer-bedding directions, i, 635.
Mattock, grubbing-axe, and grubbing-mattock—(illusts.), descript. and uses of, i, 173, 174.
Maxillaria—calendrical directions, i, 5, 13, 18; descript. and cult., i, 577.
May apple—descript. and cult. of plant, i, 370.
Meadow Rue—descript. and cult. of, i, 375.
Meadow-sweet—descript. and cult. of, i, 375.
Mealy-bug—descript. and treatment, i, 68.
Measuring-rods—descript. and use of, i, 182.
Meconopsis—species, &c., descript., cult., and illust. of, i, 365.
Medinilla—species, &c., descript., cult., and illust. of, i, 553.
Medlar—descript. (illust.), history, and uses of fruit, ii, 261, 262; general cult., propagation, soil, pruning and training, treatment of fungus, &c., ii, 262, 263; list of vars., ii, 263; gathering and storing the fruit, ii, 263; calendrical directions, ii, 533, 539, 554.
Medula—formation of, i, 36.
Medullary rays—descript. of, i, 36.
Megaspores—formation of, i, 48.
Melaleuca—species, &c., descript. and cult., i, 538.

Melia Azedarach—for the subtropical garden, i, 644.
Mellanthus major—for the subtropical garden, i, 644.
Melissa—ornamental perennial *M. officinale*, descript. and cult., i, 365; *M. officinalis*—descript., cult., and uses of, ii, 402.
Melittis melissophyllum—descript. and cult., i, 365.
Melolontha vulgaris—descript. and treatment, i, 103.
Melon—
 Calendrical directions for forcing, ii, 534, 537, 539, 542, 544, 546, 549, 551, 553, 554.
 Construction of house and trellis (illust.), bottom-heat pipes, &c., ii, 319, 320.
 Culture in America and Persia, ii, 316.
 General treatment—temperature and supply of bottom-heat and moisture, ii, 316, 317, 318; soil and manure, ii, 316; sowing the seeds and care of young plants, ii, 317, 318; preparation of beds, ii, 318; planting, training, and stopping, ii, 318; setting the flowers, ii, 318, setting for succession of fruit, ii, 320; support of fruit, use of boards or nets (illust.), ii, 319, 321.
 Insect pests—treatment of, ii, 317, 321.
 List and classification of vars.—descript. and illusts., ii, 321, 322.
 Male and female flowers—illust. and descript., ii, 317, 318.
 Origin and extent of cultivation, ii, 316.
 Packing methods, ii, 380.
Menispermum canadense—descript. of, i, 309.
Mentha Pulegium gibraltaricum—for carpet-bedding, i, 640.
Mentha viridis, *M. Pulegium*, *M. piperita*—descript., uses, and cult., ii, 462.
Menyanthes trifoliata—descript. of, i, 381.
Menziesia—descript. of plants grown as species of, and of *M. globularis* and vars., i, 309.
Merendera—species, &c., descript. and cult., i, 365.
Merodon Narcissi—(illust.), descript. and remedies, i, 107.
Mertensia—species, &c., descript. and cult., i, 365.
Merula vulgaris, *M. musca*—as garden friends, i, 118.
Mesembryanthemum—descript. and cult. of hardy annual species, &c. (illust.), i, 395, of greenhouse and succulent plants (illust.), i, 538, 620; *M. cordifolium* for carpet-bedding, i, 640.
Mespilus lobata, *M. domestica*—descript. of, i, 309, 310; cult. for fruit (see titles Medlar, Quince).
Meteorology—
 Instructions for taking observations, i, 20, 21, 25.
 Instruments for garden equipment—illusts., prices, and management, i, 21-25.
 Literature on, i, 25.
 Wind, direction of—means of taking, i, 25.
Metrosideros—species, &c., descript. and cult., i, 538.
Mezereon—descript. of shrub, i, 299.
Mice—protection of fruit, seed, &c., against, i, 77; ii, 383, 483; field mice or voles—descript. and treatment of, i, 104, 105.
Michaelmas daisies—descript. and cult. of perennial species, &c., i, 351, of annuals, i, 402, for summer-bedding, i, 633.
Michauxia—species, &c., descript., cult., and illust. of, i, 366.
Microbes—descript. of, i, 30; influence on nutrition of plants, i, 43.
Microlepia—(see Davallia).
Microyle of ovule—formation, i, 53, fertilization, i, 54, 60.
Microspores—formation of (illust.), i, 39, 48, 51, 52.

Midrib of leaf—formation of, i, 39, 40.

Mignonette—calendarial directions, i, 8, 11, 12, 15, 19; descript. and cult., i, 397, for forcing, i, 627, for summer-bedding, i, 632.

Mildew—cause and treatment of rose mildew (illusts.), i, 124, 125; vine-mildew (illusts.), i, 126, 128; ii, 290; wheat-rust, i, 125; apple-tree, ii, 72; peaches and nectarines, ii, 179, 189; apricots, ii, 198; fungicide preparation, i, 130.

Milky slug—descript. and treatment, i, 93.

Millipedes—(illust.), as root enemies, descript. and treatment, i, 106.

Miltonia—native habitats of, i, 557; species, &c., descript., cult., and illust. of, i, 577, 578.

Mimosa pudica—as a stove plant, i, 553.

Mimulus—annual plants, descript. and cult., i, 395; *M. glutinosus* as a greenhouse shrub, i, 539.

Mint—drying process, ii, 356; descript., uses, and cult. of species for economic purposes, ii, 462; foreign names of, ii, 528; calendarial directions, ii, 533, 537, 541, 556, 559.

Mirabilis jalapa and other annual forms—descript. and cult., i, 395.

Mistletoe—descript. of parasite, i, 325.

Mitrasia coccinea—as a greenhouse plant, i, 538.

Mole-cricket—(illust.), descript. and remedies, i, 107.

Molopospermum citicarium—descript. and cult., i, 366.

Monarda (Bergamot)—species, &c., descript. and cult., i, 366.

Monkey flower—descript. and cult., i, 395.

Monochætum—descript. and cult., i, 538.

Monocotyledons—descript. of, i, 37, 39.

Monstera deliciosa—descript. and cult. as stove plants and in subtropical garden, i, 553, 645.

Montagnæa heracleifolia—for the subtropical garden, i, 645.

Montbretia—for summer-bedding, i, 632, 636.

Mooneed—descript. of climber, i, 309.

Moræa—species, &c., descript., cult., and illust. of, i, 539.

Morchella esculenta—(illust.), descript. and uses of, ii, 462, 463.

Morel—descript., illust., uses, and cult., ii, 462, 463; foreign names of, ii, 528.

Morina longifolia—descript. and cult., i, 366.

Morisia hypogæa—descript. and cult., i, 366.

Mormodes—descript. and cult. of, i, 578.

Morus—descript. and cult. of hardy ornamental species, i, 310; cult. of fruit and descript., illusts., and origin of the mulberry, ii, 265-267.

Moss and lichens on apple-trees, &c.—treatment of, ii, 39, 72.

Motacilla boarula, M. Yarellii—as garden friends, i, 118.

Moth orchids—descript. of, i, 580.

Moths—as plant enemies, descript. and treatment, i, 71, 75, 76, 77, 81, 84, 85, 86, 87, 88, 92, 94, 97, 98, 99, 104, 105, 108, 111, 112, 113, 114.

Mottled Umber moth—(illust.), descript. and treatment, i, 87.

Mount Etna broom—descript. of, i, 303.

Mountain ash-tree—descript. of, i, 314.

Mountain avens—descript. and cult., i, 357.

Mountain spinach—(see Orach).

Muehlenbeckia complexa—descript. of, i, 310.

Mulberry fruit culture—descript., origin, and uses of *Morus nigra*, *M. rubra*, *M. alba*, ii, 265, 267; soil, situation, propagation, ii, 265, 266; planting, pruning, and training, ii, 267; gathering the fruit, ii, 267; illusts. of *M. nigra* and of tree in Liverpool, ii, 266, 267; calendarial directions, ii, 533, 536.

Mulberry trees—descript. of paper mulberry, i, 293, of hardy ornamental species, i, 310. (See also title Mulberry fruit culture.)

Mus Musculus, M. sylvaticus, M. decumanus—protection of fruit, decays, &c., against, i, 77, 78.

Musa—descript. and cult. of greenhouse species, i, 539, stove species, i, 553, subtropical garden plants, i, 641, 645; banana culture—origin, illusts., &c., of *M. sapientum*, *M. Cavendishii*, ii, 308-310.

Muscari—(illust.), species, &c., descript. and cult., i, 366.

Muscicapa grisola, M. luctuosa—as garden friends, i, 117.

Mushroom—
Artificial production out-of-doors—preparation and illust. of the spawn, analyses and application of dungs used, &c., ii, 463-465; method used by London market-gardeners, ii, 465.
Calendarial directions for forcing, ii, 534, 537, 539, 542, 544, 548, 551, 552, 554, 556, 559.
Conditions essential to growth—influence of light, supply of nitrogen, ii, 463; analyses table showing per cent of nitrogen in dungs used, ii, 464.
Culture indoors—construction and management of mushroom-house (illust. of cave), ii, 465; materials for beds, pots, boxes, &c., general cultural directions, ii, 466.
Culture in fruit-room, ii, 385.
Descript., illust., and extent of cult., i, 123; ii, 463.
Foreign names of, ii, 528.
Packing, ii, 565.
Taking the crop—method of removing mushrooms, ii, 466, 565.
Musk mallow—descript. and cult., i, 365.
Mussenda frondosa—as a stove plant, i, 553.
Mustard—seed quantities for cropping, ii, 391; descript., uses, general cult., and forcing directions, ii, 466, 467; foreign names of, ii, 528; calendarial directions, ii, 535, 543, 546, 552, for forcing, ii, 534, 559; packing, ii, 565.
Mustela vulgaris—as garden friend, i, 122.
Mutisia—descript. of climbers, i, 310.
Mycelium of parasitic fungus—production of, i, 123, 124.
Myosotidium mobile—descript. and cult., i, 366.
Myosotis—calendarial directions, i, 5, 6, 14, 17; descript. and cult. of perennial species, &c. (illust.), i, 366, 367, of marsh plants, i, 386, of annual species, &c., i, 396, for spring-bedding, i, 630.
Myrica—species, &c., descript. and cult., i, 310, 386.
Myriophyllum proserpinacoides—descript. of, i, 381.
Myrobalan—(see Cherry plum).
Myrtles—calendarial directions, i, 19; descript. and cult. of myrtle and wax-myrtle, i, 310, of greenhouse species, Australian myrtle, &c., i, 538, 539.
Myrtus—(see Myrtles).
Mytilaspis pomorum—(illust.), descript. and treatment, i, 68.
Myzus Cerasi, M. Ribis (illust.), M. Persicæ—descript. and treatment, i, 83, 84, 88.

N

Nægelia—(see Isoloma).

Nail bag—descript. and use of, i, 195.

Names of culinary vegetables in English, French, and German—lists of, ii, 527-530.

Names of plants—explanation of terms and method of classification used by botanists, &c., i, 65-67.

Nandina domestica—as a greenhouse shrub, i, 539.

Narcissus—
Calendarial directions, i, 3, 13, 14, 17, 18, 20.
Daffodil section—colour in, i, 469; crossing with narcissus, i, 470; pot cult., i, 471; for wild garden, i, 472; lists of wild species, i, 472, 474; lists of garden vars., i, 474-477. (See also sub-headings General culture, Illusts., &c.)
Description of genus and extent of cult., i, 469; special narcissus conferences on, i, 470.
Forcing forms and directions, i, 471, 627.
Garden vars.—best, i, 470; price of seedlings, &c., and descriptive lists arranged in groups, i, 474-477.
Gathering and packing flowers, i, 472.
General culture—species suitable for gardens, i, 470, 474; general directions, i, 470, 471; pot cult., i, 471; water cult. and narcissus for wild garden, i, 472.
Hybridization—examples of Star Narcissus, i, 61.
Illusts.—narcissus naturalized on bank of stream, i, 470; Polyanthus Narcissus in pot, i, 471; daffodil grown in water, i, 472; Hooped Petticoat Daffodils, i, 473; Narcissus triandrus albus, i, 474; groups of daffodils, i, 475.
Spring-bedding—section suitable and directions for, i, 630.
Narcissus fly—(illust.), descript. and remedies, i, 107.
Narthecium ossifragum—descript. of, i, 386.
Nasturtium—descript. and cult. of ornamental forms, i, 399, of forms (illusts.) used as cress, ii, 440, 441, 467, 554; foreign names of, ii, 528.
Nectarine—(see title Peach and Nectarine).
Nectria ditissima—(illust.), descript. of, i, 125.
Neillia—species, &c., descript. of, i, 310.
Neirembergia gracilis—for summer-bedding, i, 636.
Nelumbium—species, &c., descript., illust., and cult., i, 381.
Nematoid worms—(illust.), descript. and remedies, i, 107, 108.
Nematus Ribesii—(illust.), descript. and treatment, i, 85, 86.
Nemesia strumosa and N. floribunda—descript. and cult., i, 396.
Nemophila—calendarial directions, i, 14; descript. and cult. of, i, 396.
Nepenthes—descript., origin, and cult., illusts. of pitchers of *Nepenthes* and of *N. Tiveyi*, i, 477, 478; insect pests, &c., i, 478; list of best species and hybrids, i, 478, 479.
Nephrodium (Lastrea)—decorative ferns, i, 584; descript. and cult. of stove and greenhouse plants, i, 595, 596, of hardy species, &c. (illust.), i, 606, 607.
Nephrolepis—decorative ferns, i, 584; illusts. of, i, 584, 597; species, &c., descript. and cult., i, 596.
Nerine—calendarial directions, i, 14; descript., origin, cult., and illust., i, 479; principal growers, i, 479; list of best species and hybrids, i, 480.
Nerium Oleander—as a greenhouse shrub, i, 539.
Nertera depressa—(illust.), for carpet-bedding, i, 640.
Nets and netting—for protection of fruit, &c., ii, 207.
Nettle-tree—descript. of, i, 294.
Neviusia alabamensis—descript. of, i, 310.
New Jersey tea shrub—descript. of, i, 294.
New Zealand flax—descript. and cult., i, 540, 645.
New Zealand spinach—(illust.), descript., uses, and cult., ii, 467; foreign names of, ii, 528; calendarial directions, ii, 539, 543, 546; packing, ii, 567.

Nicotiana—species, &c., descript. and cult., i, 396; for the subtropical garden (illust.), i, 645.

Nierembergia rivularis—descript. and cult., i, 366.

Nigella—species, &c., descript., cult., and illust., i, 396.

Night-soil—as manure, i, 158.

Nipholobolus—(see *Polypodium*).

Nitrites and nitrates—formation of, i, 134.

Nitrogen—

Ammonia formation—combination of nitrogen and hydrogen, i, 143.

Assimilation of free nitrogen by plants—question of, i, 141, 142, 146.

Increase of nitrogen formed during process of decay, &c., of certain vegetable products—table showing, i, 138.

Leaves of trees—table showing amount of nitrogen in, i, 138; power of plants to absorb nitrogen by their leaves, i, 144.

Loss of nitrogen as nitric acid, &c., in drainage—table showing, i, 133.

Mushroom culture—supply of nitrogen essential to, ii, 463; analyses showing per cent of nitrogen in various dunges used, ii, 464.

Nitrogen as ammonia and nitric acid, in the rainfall of three years, &c.—table showing, i, 142, 143.

Nitrogen as nitrates in drainage water—table showing amounts, i, 132.

Nitrogen in soil—combinations of ammonia and other bases, i, 43.

Organic matter and nitrogen in various soils—table showing amounts of, i, 150.

Plant nutrition—importance of nitrogen, and effect of nitrogenous manures, i, 42, 43, 137, 144; air as a source of food, i, 44.

Rothamsted soils—amount of nitrogen as nitric acid per acre in, i, 133.

Sources of the nitrogen of crops—humus as a source, i, 136; combined nitrogen in rain, &c., i, 142; other sources of combined nitrogen, i, 143-146.

Sources of the nitrogen of vegetation—question of, i, 141.

Nodes and internode of stem—descript. of, i, 38.

Nolana—descript. and cult. of, i, 396.

Nomenclature, system of—explanation of principle of, i, 67.

Non-alcoholic drinks, production of—use of fruit juices for, ii, 358.

Notaspargium Carmichaeliae—descript. of, i, 310.

Nothochlæna—descript. and cult. of stove and greenhouse species, i, 597, of hardy species, i, 607.

Nucellus of ovule—formation of, i, 53.

Nucleus—formation of (illust.), i, 27.

Nuphar—species, &c., descript. of, i, 382.

Nut-weevil—descript. and treatment, i, 77.

Nuthatch—as a garden friend, i, 119.

Nutrition of plants—

Air as a source of food, i, 43.

Bacteria or microbes—influence on, i, 43.

Conditions of plant life, i, 41.

Leaf functions, i, 40, 41.

Light, action of, i, 44.

Movement of liquids in plants, i, 44.

Overfeeding—effect of, i, 63.

Soil as a source of food, water, and air, i, 41-43; Rothamsted experiments, i, 42.

Nuts—formation of, i, 56. (For special nut, see titles Chestnut, Hazel-nut, &c.)

Nuttallia cerasiformis—descript. of, i, 310.

Nycterinia—descript. and cult. of, i, 396.

Nymphæa—cultural requirements, methods of planting, &c., i, 378-380; descript. of species, &c. (illusts.), i, 382, 383; illust. of *Nymphæa pond*, i, 380.

Nyssa—species of, descript., i, 310.

O

Oak-trees—pruning (illust.), i, 253-255, 256; descript. of genus, species, &c., i, 315.

Oca—(see *Oxalis crenata*).

Ocimum basilicum (illust.) and **O. minimum**—descript., cult., and uses of, ii, 402, 403.

Ocypus olens—(illust.), as a garden friend, i, 115.

Odontoglossum—calendarial directions, i, 2, 3, 5, 7, 8, 11, 13, 18, 19; native habits and cultural requirements, i, 557, 561, 563; house for, construction and management, i, 559, 560, 561, 562; species, &c., descript., cult., and illusts., i, 578, 579.

Oenothera—descript. and cult. of perennial species, &c., i, 367, of annual species, &c., i, 396, of *O. biennis* as a vegetable, ii, 519.

Old Man's Beard—descript. and cult. of climber, i, 296, 556.

Olea—species of, descript. and cult., i, 539.

Olearia—descript. and cult. of hardy ornamental species (illust.), i, 310, of greenhouse species (illust.), i, 539, 540, of *O. stellata* for forcing, i, 623.

Oleaster—descript. of shrub, i, 300.

Olive-tree—as greenhouse plant, descript. and cult., i, 539.

Omphalodes—descript. and cult. of perennial species, &c., i, 367, of annual *O. linifolia*, i, 397.

Oncidium—calendarial directions, i, 2, 5, 10, 16, 18; species, &c., descript., cult., and illust., i, 578, 580.

Onion fly—descript. and remedies, i, 108.

Onions—

Autumn-sown—directions for sowing and subsequent cult., ii, 471.

Calendarial directions, ii, 532, 535, 538, 541, 543, 546, 548, 550, 552, 554, 558; for forcing, ii, 537, 539, 542.

Cottage-garden, &c., crops—methods of cult. for, ii, 472.

Crops onions may follow and be succeeded by, ii, 390.

Descript., history, and extent of cult., ii, 468.

Egyptian onions—(illust.), cult. of, ii, 472.

Forcing directions, ii, 472.

Foreign names of, ii, 528.

Gathering and storing the crop—directions and illust., ii, 469, 470, 566.

Insect pests, &c.—list of, ii, 474.

Lists (illusts.) of vars.—distinction and descript. of sorts, ii, 473-475; classified list of onions exhibited at vegetable conference, ii, 475.

Offset onions—sowing, &c. directions, growth of "scallions", ii, 471.

Packing, ii, 566.

Pickling sorts—descript. and cult., ii, 470.

Planting small bulbs of preceding year's growth, ii, 471.

Potato onions—(illust.), cult. of, ii, 471, 472.

Preserving—drying process, ii, 356.

Saving seeds—directions, ii, 472, 474.

Seed quantities required for cropping, ii, 391.

Size of bulbs—effect of spring, autumn, &c., sowings, ii, 470.

Soil and manures, ii, 468.

Spring-sown—directions for sowing and after-treatment of plants, ii, 468, 469, for exhibition plants, ii, 471.

Oniscus asellus—descript. and treatment, i, 99.

Onoclea—species, &c., descript. and cult., i, 607.

Ononis arragonensis—descript. of, i, 310.

Onosma—species, &c., descript., cult., and illust., i, 367.

Onychium japonicum—as decorative ferns, i, 584.

Oosphere—descript. of, i, 53.

Oospore—descript. of, i, 53.

Opuntia—species, &c., descript. and cult., i, 620.

Orach—descript., uses, illust., and cult., ii, 475, 476, 546; foreign names of, ii, 528.

Orange scale—descript. and treatment, i, 92.

Oranges, Lemons, &c.—

Citrus genus—descript. and origin, species used for horticultural purposes, ii, 310, 311.

Construction of house, beds, drainage, &c., ii, 311, 312; orchard-house, ii, 274.

General treatment—soil, manure, planting, ii, 311; bottom-heat, temperature, ventilation, ii, 312, 313; pot cult., ii, 313; flowering and fruiting periods, ii, 313; plants in bad health, ii, 313, 314; shade, syringing, and water, ii, 313, 315; pruning, training, ii, 313, 314; propagation, ii, 314.

Illusts.—orange, ii, 311, orange-tree on wall in open air at Osborne, ii, 312, lemon, ii, 313, lime, ii, 314, shaddock, ii, 315.

Insect pests, &c.—treatment of, ii, 313, 315.

Lists of vars., descript. and illusts.—orchard-house, ii, 274, oranges, ii, 315, lemons, limes, and pomelos, ii, 316.

Orchard-house culture—vars. suitable, &c., ii, 274, 275.

Packing methods and form of package used in colonies, ii, 371.

Preserving methods, ii, 350.

Orchard-house for Fruit Culture—

Choice and form of trees suitable for, ii, 275.

Construction (illust.) and temperature to suit various fruits, ii, 273, 274.

General management—potting or planting-out trees, ii, 275; soil preparation, top-dressing mixture, ii, 276; flowering period and fertilization of flowers, ii, 276; summer and autumn treatment, ii, 276, 277.

Illusts.—fruit-trees grown in orchard-house, ii, 275, pear-tree in pot, ii, 276, peach-tree in pot, ii, 277.

Insect pests, &c.—treatment of, ii, 278.

Lists of fruit suitable for culture in, ii, 278. [For special fruit, see its name.]

Orchards—

Calendarial directions (see Calendar of Operations in the Fruit- and Kitchen-gardens).

Commercial plantations of apples and pears (see titles Apples, &c., for Market, Pears for Market).

Formation of new orchards—primary considerations, ii, 32; choice of site, ii, 32, 33; soil suitable, preparation and improvement of soil, ii, 33, 34; use of grass-land, ii, 34; manurial applications, ii, 35. (See also sub-heading Plans.)

General management—treatment of ground in plantation, extent and protection of cultivated area around trees, ii, 37, 38; catch-cropping, influence of, ii, 38, 39; manuring, general routine work, removal of trees for thinning purposes, ii, 39.

History of orchard establishment in British Isles, ii, 32.

Improvement of old orchards—directions, ii, 39.

Plans (illusts.) for planting—Evesham orchard, ii, 32; various systems, ii, 34-36; for mixed plantations, ii, 36, 37.

Soil suitable—examples of chemical analysis of various soils, ii, 33, 34; improvement measures, ii, 34.

Spraying fruit-trees (see that title).

Surplus and waste produce—utilization of (see Fruit-preserving).

Orchid-houses—

Arrangement of plants in, i, 566; foliage plants used for decorative purposes, i, 569.

Calendarial directions for management of, i, 2, 3, 5, 7, 8, 10, 11, 13, 14, 16, 17, 19.

Orchid-houses (cont.)—

Construction of houses, &c.—use of old plant-houses, i, 558, 560; plans (illustr.) of intermediate and cool house, i, 558, 559; stages and floors, i, 559; heating, water-supply, and tank arrangements, ii, 559, 560; shading arrangements (illustr.), i, 561.

Humidity of atmosphere, regulation of moisture, &c., i, 562, 564.

Single orchid-house—management of, i, 557, 569.

Temperatures—regulation directions, table of temperatures, &c., i, 557, 562, 564.

Ventilation arrangements and regulation, i, 559, 564.

Orchids—

Arrangement of plants in houses, i, 566.

Basket orchids—treatment of, i, 566, 568.

Calendarial directions (see Orchid-houses).

Classification of, i, 565; meaning of terms "terrestrial" and "epiphytal" orchids, i, 563.

Collecting orchids—selection of fresh imported orchids, i, 561; time for collecting and manner of packing, &c., i, 569.

Cut flowers—treatment of in packing, &c., i, 568; arrangement for floral decoration, i, 649, 650.

Disease and insect pests—scale insects, i, 92, general treatment of insects, i, 568, "spot" disease treatment, i, 569.

Foliage plants suitable for growing in same house as, i, 569.

Fresh imported orchids—selection and treatment, i, 561, 562.

General remarks on culture—native habitats of various species, &c., i, 557, 558.

Growing season treatment, i, 565.

Hardy and cold-framed orchids and satyriums—treatment of, i, 564; species suitable for near water, descript. and illustr., i, 386, 387.

Houses for—construction, &c. (see Orchid-houses).

Humidity of atmosphere, i, 562, 564.

Hybridization and crossing—mode of procedure, i, 61, removal of pollen-masses (illustr.), i, 62; examples of wild hybrids found among tropical plants, i, 61; illustr. and treatment of artificially-raised hybrids, i, 567.

Lists of showiest species, hybrids, &c.—descript., cult., and illustrs., i, 570-582.

Manure for—use of peat, &c., i, 155, 568.

Potting—pots and protectors (illustr.) for, i, 191, 192; potting materials, and time and methods of potting, i, 562-564.

Propagation methods, i, 226, 227, 556; hybrids, i, 557.

Pruning methods, i, 567.

Resting orchids—damage by high temperature, i, 557, process of resting, &c., i, 566, 568.

Temperature—damage by excessive temperature, i, 557; native habitats of species, i, 557, 558; table of temperatures and regulation directions, i, 562, 564.

Ventilation regulations, i, 564.

Watering and syringing, i, 560, 561, 565, 566.

[For particular orchids, see titles *Cattleya*, *Dendrobium*, &c.]

Orchis—species, &c., descript. and cult., i, 367.

Order or Family—botanical meaning of term, i, 66.

Oreopanax—species of, descript. and cult., i, 539.

Organic matter in various soils—table showing amount of, i, 150.

Orgyia antiqua—(illustr.), descript. and treatment, i, 97.

Origanum—descript., uses, and cult. of species, ii, 462.

Ornamental Water in Pleasure-grounds—

Fountains in flower-gardens—use of, i, 269.

Ornamental Water in Pleasure-grounds (cont.)—

General directions for construction of artificial lakes and uses of brooks, &c., i, 282-284.

Illustr. of water-garden, i, 281.

Structural decorations, construction of boat-house, Chinese pagoda, &c., i, 281.

Trees and shrubs suitable for planting on banks of, i, 281, 282, 283, 378.

Walks in vicinity of—drainage of, i, 282.

Ornithogalum—species, &c., descript. and cult., i, 367, 368.

Orontium aquaticum—descript. of, i, 386.

Osage orange-tree—descript. of, i, 368.

Osmanthus—calendarial directions, i, 19; descript. of *O. ilicifolium* and vars., i, 310, of *O. ilicifolius* for winter bedding, i, 647.

Osmunda—marsh species, &c., descript. of *O. regalis*, i, 386; hardy species, &c., descript. and cult., i, 607.

Ostrowskia magnifica—(illustr.), descript. and cult., i, 368.

Ostrya vulgaris, O. virginica—descript. of, i, 310.

Otiiorhynchus picipes—(illustr.), descript. and treatment, i, 80, 83.

Otiiorhynchus sulcatus—(illustr.), descript. and treatment, i, 80.

Otiiorhynchus tenebriococcus—descript. and treatment, i, 89, 96.

Otus vulgaris—as garden friend, i, 118.

Ovary—formation of, i, 30, 48, 49, 52, fertilization of, i, 53, 60, fruit formation and process of ripening (illustr.), i, 56.

Ovule—formation of (illustr.), i, 30, 48, 49, 50, 52, 54; fertilization (illustrs.), i, 52, 53, 54, 57, 60; after fertilization (illustr.), i, 60.

Owls—as garden friends, i, 117.

Oxalis—descript. and cult. of hardy perennial species, &c. (illustr.), i, 368, of greenhouse plants, i, 539; *O. crenata* (illustr.) and *O. Acetosella* as vegetables, ii, 476, 524; foreign names of *Oca*, i, 528.

Oxera pulchella—as a stove plant, i, 553.

Oxlip—hybridization of, example (illustr.), i, 61.

Oxycooccus palustris, O. macrocarpus—descript., illustrs., and cult., i, 310; ii, 271, 272.

Oxydendron arboreum—descript. of, i, 310.

Oxygen—nutrition of plants, i, 43, 44.

Oxylobium—species, &c., descript. and cult., i, 539.

Oxytropis—species, &c., descript. and cult., i, 368.

Ozothamnus rosmarinifolius—(illustr.), descript. of, i, 311.

P

Pachyphytum—(see *Cotyledon*).

Packing flowers—bouquets, &c., i, 650, boxes for flowers, ii, 369.

Packing Fruits for Road or Rail—

Apples and pears (see those titles, sub-heading Grading and packing).

Bags—fruit packed in, disadvantages of, ii, 374.

Barrels—use of in America and the colonies, rules as to size and methods of packing, ii, 373, 374.

Baskets for—(illustrs.), use and merits of round, flat, and handle baskets, ii, 371, 372.

Boxes for—development of industry of box-making, ii, 368; fruits suitable for boxes, ii, 368, 369; disadvantage of large boxes, ii, 369; shallow boxes, use of and method of securing together (illustr.), ii, 369; sizes and prices of various forms, ii, 369, of railway companies' boxes, ii, 370, of boxes used in colonies, &c. (illustrs.), ii, 370, 371.

Packing Fruits for Road or Rail (cont.)—

Cases or crates—forms used in New Zealand, &c. (illustr.), ii, 370, 371; use of cases for small packages, ii, 372; crate with fruit in handle-basket (illustr.), ii, 372, 373, crates for punnets of strawberries, &c. (illustr.), ii, 373.

Choice fruits—essentials in packing, ii, 375; methods of packing grapes (illustr.), ii, 375, 376, 380, peaches, nectarines, and apricots, ii, 187, 376, 377, figs and pine-apples, ii, 377.

Exportation on shipboard—special systems for, ii, 365.

Materials for packing—use and price of wood-wool, cotton-wadding, dry moss, straw, paper, &c., ii, 374, 375.

Miscellaneous fruits—methods of packing melons and cucumbers, ii, 380; tomatoes, ii, 369, 372, 380.

Packages for—questions of cost, strength, appearance, and size, ii, 368; labels suitable, ii, 368. (See also sub-headings Boxes, Baskets, Cases, &c.)

Packers—employment of skilled and ordinary labour, duties of packers, &c., ii, 73, 74, 75, 367.

Packing-houses, -rooms, or -sheds—construction of (illustrs. of plans), and tables suitable for, &c., ii, 365-367.

Preserved fruit—jam, ii, 348, dried fruit, ii, 356.

Railway rates for fruit conveyance and care of packages, &c., ii, 79, 365, 370.

Small fruits—grading at time of packing, ii, 377; methods of packing strawberries, raspberries, and gooseberries, ii, 377, 378; crates for strawberries (illustr.), ii, 373.

Stone fruits—plums, ii, 377, 378, damsons and cherries, ii, 378.

Value of proper packing and importance of grading, ii, 364, 365, 378.

Weighing the fruit—arrangements and machines for, ii, 367.

Packing-houses, -rooms, or -sheds—construction (illustrs.) and tables for, ii, 365-367.

Packing Vegetables—artichoke, asparagus, ii, 561; beans, beet, borecole, broccoli, ii, 562; Brussels sprouts, cabbages, cardoon, carrots, cauliflowers, celeriac, celery, ii, 563; chicory, cucumbers, endive, herbs, kale, kohlrabi, leeks, ii, 564; lettuces, maize, mushrooms, mustard and cress, ii, 565; onions, parsnips, peas, potatoes, ii, 566; radishes, rhubarb, salsify, Savoy cabbages, scorzonaria, sea-kale, spinach, tomatoes, ii, 567; turnips, vegetable marrow, water-cress, ii, 568; hampers of vegetables, ii, 569.

Pæony—tree pæonies (*P. Montan*)—descript., cult., illustr., and list of vars., i, 311, 480, forcing directions, i, 621, 623; herbaceous pæonies—species, &c., descript., cult., illustr., and list of vars., i, 368, 480, 481.

Pæony drooping disease—(illustr.), descript. of, i, 130.

Pale brindled beauty moth—descript. and treatment, i, 87.

Paliurus aculeatus—descript. of, i, 311.

Palms—

Calendarial directions, i, 2, 4, 9, 10, 13, 28. *Chusan palm* or *Trachycarpus excelsus*—(see title *Chusan Palm*).

Cycads (see that title).

Decorative palms for conservatories, halls, &c.—descript. and treatment, i, 527, 608.

Descript. and history of various species, &c., i, 608.

General culture—soil and manure, i, 141, 609, propagation, i, 608, potting or planting out in beds, temperature, &c., i, 609.

Illustrs. of palm-house and great palm stove at Kew, i, 608.

Insect pests—descript. and treatment of scale insects, &c., i, 92, 609.

Palms (cont.)—

List of species suitable for conservatory—descript., cult., and illusts., i, 609-613.
Subtropical garden—palms and position of plants suitable for, i, 641, 642.

Vascular bundles in—arrangement of, i, 37.
Pampas grasses—descript. and illust., i, 385, 386.

Panax—species, &c., descript. and cult., i, 553.

Pandanus—calendrical directions, i, 2, 6, 7, 12; descript. and cult., i, 553.

Panicum—calendrical directions, i, 2, 6; descript. of plants, i, 553.

Pansy—(see *Viola*).

Papaver—descript. and cult. of perennial species, &c., i, 368, of annual plants, i, 397.

Paper—use and prices of plain, tissue, and ornamental paper for packing fruit, &c., ii, 374, 375, 384.

Parasites—descript. of, i, 29, of parasitic fungi, i, 223.

Paris green—as an insecticide, ii, 43.

Parks—trees and shrubs suitable for, i, 327, 339, 340.

Parnassia—species, &c., descript., cult., and illust. of, i, 369, 386.

Parrot flower—descript. and cult., i, 297, 533.

Parrotia Jacquemontiana, P. persica—descript. of, i, 311.

Parsley—drying process, ii, 356; fool's-parsley (illust.), descript. of, ii, 477; true and Hamburg parsley (illusts.), descript. and cult., ii, 477, 478; foreign names of, ii, 528; calendrical directions, ii, 532, 535, 538, 541, 543, 548, 552, 558.

Parsley fern—descript. and cult., i, 605.

Parsnip fork—(illust.), use of, ii, 478.

Parsnips—crops parsnips may follow and be succeeded by, ii, 390; seed quantities, ii, 391; descript., uses, &c., insects, &c., and list (illust.) of vars., ii, 478, 479; foreign names of, ii, 528; calendrical directions, ii, 538, 541, 543, 546; packing, ii, 566.

Partridge—as garden friend, i, 118.

Parus caeruleus, P. major, P. ater, P. palustris, P. caudatus—as garden friends, i, 118.

Passiflora—calendrical directions, i, 11, 15; fertilization of, i, 55; descript. and cult. of hardy species, &c., i, 311, of green-house plants, i, 539, of stove plants (illust.), i, 553, 554.

Passion-flowers—(see *Passiflora*).

Pastinaca sativa—descript., uses, and cult., ii, 478.

Pasture land—amounts of nitrogen and organic matter in, i, 150.

Paterosnia—species, &c., descript. and cult., i, 539.

Paulownia imperialis—descript. and cult., i, 311.

Pavetta borbonica—descript. and cult., i, 554.

Pea (flowers)—hardy perennial species, &c., descript., cult., and illusts., i, 363; hardy annuals—calendrical directions, i, 3, 5, 7, 12, descript., illust., and cult. of, i, 393, for summer-bedding, i, 635.

Pea (vegetables)—

Calendrical directions, ii, 532, 536, 538, 541, 543, 546, 548, 550, 552, 558; for forcing, ii, 534, 537, 539.

Crops peas may follow and be succeeded by, ii, 390.

Cross-fertilization—experiments and directions, ii, 479, 480.

First early peas—cult. of main crop in open quarters and of peas for market, ii, 481, 482; earliest crops—modes of cult. in open border, sowing in pots, boxes, &c., and French method, ii, 482-484; protection from frost, ii, 484.

Foreign names of, ii, 528.

Garden pea (illusts.) and field pea—descript., distinction between, origin of name *Pisum*, and history of cult., ii, 479.

Pea (vegetables) (cont.)—

Insects, &c.—list of, ii, 485.

Lists (illusts.) of vars. for early, main, and late crops, ii, 485-487; a selection of leading vars. for gardens and market, ii, 487.

Main crop and late peas—cultural directions and sorts suitable, ii, 484, 485.

Packing, ii, 566.

Planting—distances for rows, &c., ii, 481; filling up blank spaces, ii, 484.

Preserving—drying process, ii, 356.

Protection from mice, birds, &c., ii, 483, 484.

Saving seeds—directions, ii, 485.

Seed quantities required for cropping, ii, 391, 482.

Soil, manure, and artificial manures, ii, 480, 481.

Pea moth—descript. and treatment, i, 77.

Pea weevils—(illust.), descript. and treatment, i, 87, 88.

Peach and Nectarine—

Calendrical directions—outdoor, ii, 533, 536, 542, 544, 546, 548, 550, 552, 554, 556, 558; for forcing, ii, 535, 537, 539, 542, 545, 549, 551, 553, 554, 557, 559.

Culture in open-air—wall trees, &c.—

Fruit production, &c.—growth of flower and leaf-buds (illust.), ii, 169-171, 173; methods of thinning, gathering, ripening, and storing the fruit, ii, 176, 177, 179.

General treatment, condition of roots, restoration of sickly trees, &c., ii, 177.

Illusts.—various vars., ii, 167, 169, 170, 176; peach-tree on wall, shoots nailed and unnailed to expose fruit, ii, 178. (See also sub-heading Pruning and training.)

Planting trees—time and methods, ii, 169.

Pruning and training—shoots, growth of flower and leaf buds (illust.), ii, 169-171, 173; bearing shoots and successors (illust.), ii, 173, 174, 176; summer and winter pruning, ii, 171, 173, 176; time and method (illust.) of training, ii, 171-173; stopping and disbudding processes (illusts.), ii, 174, 175.

Soil and situation—wall aspect, ii, 6, 7; position and soil suitable, preparation of borders, &c., ii, 27, 167-169.

Culture under glass—

Adaptability of fruit for and conditions necessary to, ii, 180.

Choice of trees and methods of planting, training, pruning, syringing, &c., ii, 180, 182, 183, 184, 185.

Construction (illusts.) and management of house, border preparation, i, 207; ii, 180-182; fire-heat, air, temperature, ii, 183; cleaning the house, ii, 184; orchard-house, ii, 274.

Gathering and ripening the fruit, ii, 184, 185, 277.

Orchard-house—construction of, ii, 274; potting plants, ii, 275, 276; ripening fruit, ii, 277; illust. of plant, ii, 277; list of vars. suitable, ii, 276.

Peach-case and nectarine tree at Frogmore (illust.), ii, 181.

Resting period—treatment during, ii, 185.

Soil and manure suitable, and improvement of soil, ii, 180, 185, water-supply, ii, 185.

Trellis in peach-house (illust.), ii, 167. [See also sub-heading Pot culture.]

Diseases and insect pests—use of syringe and washes, &c., ii, 177, 183, 184, 185, 186; cause and treatment of various diseases, i, 129, ii, 179, 189; list of insects, &c., ii, 189.

Garden races—origin of, area and history of cultivation, &c., ii, 166.

Hardy ornamental trees—descript. of, i, 311.

Lists of vars. (illust.), explanation of arrangement and classification of fruit, ii, 189, 192; peach and nectarine vars. and fruit for special purposes, ii, 190-194; orchard-house vars., ii, 278.

Peach and Nectarine (cont.)—

Manure, effect of—results of experiments, i, 171.

Packing—methods and materials for, ii, 187, 374, 376, 377; boxes and baskets, ii, 368, 371, 372.

Pot culture—forms and vars. of trees suitable, ii, 185, 194, illusts. of trees, ii, 185, 186, 187; training, disbudding, stopping, repotting, ii, 185, 186; flowering period treatment, manure, wintering the plants, ii, 186; water supply, use of perforated pots (illust.), ii, 187.

Preserving—extent of trade in U.S.A., &c., ii, 344; drying process, ii, 355, 356; canning process, ii, 357; modes and vars. suitable, ii, 362.

Propagation—method of raising plants from stones, use of various stocks, mode of grafting, &c., ii, 188, 189.

Peach aphid—descript. and treatment, i, 88.

Peach-leaf curl disease—development and treatment, i, 129.

Peach scale—descript. and treatment, i, 69.

Pear-leaf blister moth—(illust.), descript. and treatment, i, 88.

Pear-leaf mite—(illust.), descript. and treatment, i, 88, 89.

Pear oyster scale—(illust.), descript. and treatment, i, 69.

Pear sawfly—(illust.), descript. and treatment, i, 94.

Pear-sucker—(illust.), descript. and treatment, i, 69, 70.

Pears and Pear-trees—

Calendrical directions, ii, 533, 539, 542, 546, 548, 550, 552, 554, 556.

Commercial plantations (see title Pears for Market).

Disease and insect pests—leaf fungus (illust.), i, 127; scab disease, ii, 44; canker, ii, 128; list of insects, &c., ii, 129; orchard-house treatment, ii, 278.

Fertility and sterility—causes and remedies for imperfect fertilization, ii, 123, 124.

Flavour of pears—characteristics of various vars., attention to quality of flavour, &c., ii, 102.

Forms of trees—various uses of stocks (illusts.), ii, 106-108; standards, bush, pyramid (illusts.), and espaliers, ii, 108, 109; Palmette Verrier (illust.), ii, 110, cordons (illust.), ii, 110-112; planting directions, ii, 112. (See also sub-heading Pruning and training.)

Gathering and ripening pears, ii, 126, 132, 134, 277.

General culture—essentials for, ii, 103; districts and situation, wall aspect, &c., ii, 6, 8, 104; routine work directions, ii, 124-126, winter routine, ii, 127.

Grading and packing—French and Californian systems, ii, 131, 132; importance of grading and methods (illust.) of packing, ii, 132, 134, 379; boxes for, ii, 135, 368-371, baskets, crates, and barrels for, ii, 372, 373; materials for packing, ii, 374.

History, origin, and evolution of the pear, ii, 97-99; French industry, ii, 98.

Illusts.—trees in royal gardens, Windsor, ii, 68; wild pear, ii, 96; various vars., ii, 97-101; arcade of pears, ii, 103; stocks, various forms of trees, ii, 106-108. (See also sub-headings Forms, Lists, Pruning.)

Improvement of pears—systematic methods, results, &c., ii, 99-102.

Lists—explanation of arrangement, ii, 135; descript. and illusts. of select vars., ii, 136-147; synonyms reference list, ii, 147, 148; selections for special purposes and situations, ii, 148-150.

Merits of the pear for cultivation, ii, 96.

Orchard-house culture—construction of house, ii, 274; planting, &c., ii, 275, 276; ripening fruit, ii, 277; insect pests, ii, 278; list of pears suitable, ii, 278; illusts. of trees, ii, 275, 276.

Orchard plantations—plans (illusts.), ii, 34-37; influence of grass land, ii, 38.

Pears and Pear-trees (cont.)—

Ornamental purposes—trees suitable and method of training (illust.), ii, 103.
 Packing (see sub-heading Grading and packing)
 Planting—distances, time and general directions, ii, 112, 113; wall-trees, aspect, space required (illust.), &c., ii, 6, 8, 113, 114.
 Pollination of pomaceous fruits—extract from report on, ii, 123, 124.
 Preserving—extent of trade in California and U.S.A., ii, 96, 97, 131; processes of crystallizing, ii, 350, drying, ii, 355, 356, canning, ii, 357; various methods and vars. suitable, ii, 359.
 Propagation—methods of securing stocks, ii, 105, 106; effect of intermediate stocks and double-grafting, ii, 107, 108; modes of propagation, use and rearing of pear, quince, and intermediate stocks, ii, 127, 128, 150.
 Protectors for fruit (illust.), ii, 125.
 Pruning and training—ornamental trees trained as arcade (illust.), ii, 103; directions and illusts. for standards, ii, 114, 115, pyramids, ii, 115–117, espaliers, ii, 117–119, cordons, ii, 119, 120, dwarf bushes, ii, 120, wall-trees, ii, 120–122; root-pruning, ii, 124.
 Soil suitable and improvement measures, ii, 27, 105.
 Stocks—use, merits, and methods of securing various stocks, ii, 105–108; intermediate stocks and double-grafting, ii, 107, 108.
 Storing—method and use of, ii, 126, 380, arrest of fermentation, loss of weight, &c., ii, 381; trays, preservative materials, ii, 382–384, temperature, ii, 384; vars. for, ii, 386; cold storage, ii, 388.
Pears for Market—
 Californian pears—culture and export trade, ii, 96, 126, 131, 132, 134.
 Colonial trade—development of, ii, 132.
 Considerations and essentials for establishment of plantation and business, ii, 103, 129; difficulties, expenses, and profits, ii, 129, 130, 135. (See also sub-heading Home trade.)
 Foreign trade and competition—methods adopted in France and other countries, extent of export trade, &c., ii, 130, 132.
 Gathering, grading, and packing—methods and necessity for attention to, ii, 130, 133, 134, 135; foreign methods, ii, 131, 132, 134.
 Home trade—classes of fruit confined to, ii, 129, 130; conditions necessary to sale, chief sources of pear production, ii, 132; summary of essentials, choice of vars., conveyance of fruit, &c., ii, 133–135; price of pears, ii, 133, 135.
 [For general cultural directions, &c., see title Pears and Pear-trees.]
Peat manure—formation and uses of, i, 155, 163, 167.
Peat-mould—amounts of nitrogen and organic matter in, i, 150.
Peaty marls—as manure, i, 167.
Pelargonium—calendarial directions, i, 3, 4, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18; description, origin, and cult. of garden plants, i, 481, 482, zonal section (illust.), i, 482, 483, fancy and show section (illust.), i, 483–485, ivy-leaved section (illust.), i, 485, 486, scented-leaved section, i, 486; summer-bedding forms and directions, i, 632, 636.
Pellaea—species, &c., description of, i, 597.
Pellionia—calendarial directions, i, 6; description and cult., i, 554.
Peltandra virginica—description and cult., i, 383.
Pemphigus lactuarius—description and remedies, i, 106.
Penanga—description and cult. of palms, i, 611.
Pennyroyal—description and cult., ii, 462, 541; foreign names of, ii, 528.
Pentapterygium—description, cult., and illust. of, i, 540.

Pentas carnea—as a stove shrub, i, 554.
Pentstemon—calendarial directions, i, 6, 8, 14, 16, 17; hardy perennial species, &c. description, cult., and illust., i, 369; popular garden plants—origin, cult., illust., and list of vars., i, 486, 487; summer-bedding forms and directions, i, 636.
Peperomia argyreæ—as a stove plant, i, 554.
Peppermint—description, uses, and cult., ii, 462; foreign names of mint, ii, 528.
Peptones—as plant food, i, 44.
Perdrix cinerea—as garden friend, i, 118.
Perennials, Hardy Herbaceous—
 Border for—position, preparation of ground, staking, &c., i, 340, 341; arrangement and selection of plants, i, 341–343.
 Culture, selections of plants, and formation of garden suitable for, i, 265, 266, 340.
 Illust. of herbaceous borders and beds, i, 340.
 Lists—selections for border, i, 342, 343; description, cult., and illusts. of select herbaceous and Alpine plants, i, 348–378.
 Shrubs suitable for planting with, i, 340.
 [See also titles Alpine Garden, Wild Garden; for particular plants, see generic titles.]
Perianth of flower—formation of, i, 51.
Perilla nankinensis—(illust.), for summer-bedding, i, 636.
Periploca græca—description and cult., i, 311.
Perisperm—formation of, i, 57.
Peristeria—species, &c., description and cult., i, 580.
Periwinkle—description and cult. of shrubs, i, 325, for winter-bedding, i, 647.
Pernettya—species, &c., description and cult., i, 311, P. mucronata for winter-bedding, i, 647.
Peronospora viticola—(illust.), development and treatment, i, 128.
Perry, production of—revival of trade, ii, 97, 358; pear vars. suitable for, ii, 150.
Persica Davidiana, P. vulgaris—description of, i, 311; peach cult. (see title Peach and Nectarine).
Persimmon sap—production of from Date-plum tree, ii, 263.
Persimmon tree—description and cult., i, 299, 534. (See also Date plum.)
Pescatorea—species, &c., description and cult., i, 580.
Petals of flowers—formation of (illust.), i, 50.
Petiole—description of (illust.), i, 38, 39.
Petroleum—as an insecticide, ii, 43; machine for distribution of, ii, 42.
Petunia—calendarial directions, i, 4, 10, 11; illust., description, and cult., i, 396, 397; summer-bedding plants, i, 636.
Pewit—as garden friend, i, 117.
Phacelia campanularia (illust.), **P. Whitlavia**—description and cult. of, i, 397.
Phænocoma prolifera—description and cult., i, 540.
Phala—calendarial directions, i, 7, 11, 18; species, &c., description, cult., and illust., i, 580.
Phalænopsis—calendarial directions, i, 8, 13; species, &c., description and illust., i, 580, 581.
Phanerogams—reproduction of, i, 48.
Phaseolus multiflorus—(see Scarlet-runner).
Phaseolus vulgaris—(illust.), description, uses, and history of cult., ii, 450; cult. (see Kidney bean).
Phasianus colchicus—as garden friend, i, 118.
Pheasant—as garden friend, i, 118.
Phigalia pilosaria—description and treatment, i, 87.
Philadelphus—calendarial directions, i, 3, 18; description and cult. of hardy ornamental species, &c. (illust.), i, 311, 312,

of P. mexicanus as greenhouse plant, i, 540, of plants for forcing, i, 623.
Philisia buxifolia—as a greenhouse shrub, i, 540.
Phillyrea—species, &c., description and cult., i, 312.
Philodendron—species, &c., description, cult., and illust., i, 554.
Phlebodium—(see Polypodium).
Phlomis fruticosa—description of, i, 312.
Phlox—calendarial directions, i, 14, 16; perennial species, &c., description and cult., i, 369; annual P. Drummondii, description and cult., i, 397; popular garden plants—description, origin, cult., illust., and list of vars., i, 487, 488; spring- and summer-bedding forms and directions, i, 630, 636.
Phoenix—species, &c., description and cult., i, 611, for subtropical garden, i, 645.
Phoridium—calendarial directions, i, 6; description and cult., i, 540, for subtropical garden, i, 645.
Phorodon Humuli Malaheb—description and treatment, i, 89.
Phosphoric acid in soil and leaf-mould, i, 134, 137.
Photinia—description of P. serrulata, &c., i, 312.
Phycomycetes—plant diseases caused by fungi, i, 128.
Phygelius capensis—description and cult., i, 369.
Phyllanthus—species, &c., description and cult., i, 554.
Phyllocactus—description, origin, illust., and cult. of, i, 488, lists of best species and garden vars., i, 489.
Phyllopertha horticola—description and treatment, i, 85, 105.
Phyllostachys—description and illust. of species commonly called Bambusa, i, 312; distinction of genus from Arundinaria, i, 312; cult. (see Bambusa).
Phyllotæmium—as a stove plant, i, 554.
Phyllotreta nemorum—(illust.), description and treatment, i, 96, 97.
Phylloxera vastatrix—leaf enemy, i, 89; description, illust., and remedies for root enemies, i, 109, 110.
Physalis—species, &c., description, cult., and illust., i, 369, 370.
Physostegia—species, &c., description and cult., i, 369.
Phyteuma—species, &c., description and cult., i, 370.
Phytomyza nigricornis—(illust.), description and treatment, i, 83.
Phytophthora infestans—(see Potato Disease).
Phytoptus Ribis, P. Pyri—(illusts.), description and treatment, i, 72, 88, 89.
Picea—insect pest treatment, i, 328, description and cult. of species, &c., i, 331; P. excelsa, &c., for winter-bedding, i, 647.
Pickaxe—description and use of, i, 173.
Pickel weed—description of, i, 383.
Pickfork—(illust.), description and use of, i, 174.
Picks—description and use of, i, 173.
Pieris—classification under various genera, i, 313; description and cult. of hardy species, &c., i, 313; forcing forms and directions, i, 623; winter-bedding plants, i, 647.
Pieris Brassicæ, P. Napi—(illust.), description and treatment, i, 81.
Pig's-dung—as a manure, i, 162.
Pilocereus—species, &c., description and cult., i, 620.
Pimella—calendarial directions, i, 8, 9; description and cult., i, 540.
Pimpinella Anisum—description, cult., and uses of, ii, 391.
Pincers—description and use of, i, 178.
Pine-apple—
 Calendarial directions, ii, 534, 537, 539, 542, 544, 547, 549, 551, 553, 554, 557, 559.

Pine-apple (*cont.*)—

Fruiting the pine-apple—length of time and treatment for, ii, 303.
 Hamilton's cultural system, ii, 304.
 Insect pests—treatment of, ii, 306.
 Jamaica, cultivation in—manures, &c., used, ii, 305; form and prices of fruit grown for English market and extent of export trade, ii, 305, 306; list of vars. grown, ii, 306.
 Light—supply of, position of plants in re-setting after shifting, ii, 304.
 List of best vars., *descript.* and *illustr.*, ii, 307, 308; Jamaica vars., ii, 306.
 Meudon cultural system, ii, 304.
 Moisture—watering directions and use of steam, ii, 304.
 Origin of, and history of cultivation in Europe, ii, 301.
 Packing methods, ii, 377.
 Preserving—canning process, ii, 357.
 Propagation methods, ii, 306, 307.
 Soilsuitable—preparation of, use of manure, &c., ii, 303, 304.
 Temperature and air regulations—table of suitable temperatures, benefit of warm coverings on house, ii, 301, 302; bottom-heat, ii, 303.

Pine-beetle—treatment of, i, 328.

Pine-trees—pruning, i, 256; investigations regarding culture of, i, 327; soil, species for special purposes, and treatment of insect pests, i, 327, 328; *descript.* and division of species of *Pinus*, i, 331, 332; umbrella pine (*illustr.*), *descript.* of, i, 333; screw-pines as stove plants, i, 553.

Pinks—calendarial directions, i, 13; *descript.* and cult. of sea-pinks, i, 351; of hardy perennial species, &c., of *Dianthus*, i, 356; Indian pink (*Spigelia marilandica*), i, 374; annual forms, *illustr.* of Indian pink, &c., i, 391.

Pinus—species, &c., *descript.* and classification of, i, 331-332. (See also Pine-trees.)

Plonea forficatis—*descript.* and treatment, i, 85.

Piophila Apii—*descript.* and remedies, i, 112.

Pipes for heating purposes—construction and length required for warming buildings, i, 216, 221; temperature regulations, i, 221, 222.

Piptanthus nepalensis—*descript.* of, i, 313.

Pistia stratiotes—*descript.* and cult., i, 383.

Pistil—formation of, course of pollen-tubes (*illustr.*), &c., i, 51, 60.

Plum arvense and **P. sativum**—(*illustr.*), *descript.* and distinction between, ii, 479; cult. (see *Pea*—vegetable).

Pitcairnia—species, &c., *descript.* and cult., i, 554.

Pitcher-plants—*descript.*, *illustr.*, and cult. of *Nepenthes*, i, 477-479; of North American plants, i, 514-516.

Pith—formation of (*illustr.*), i, 27, 36, 37.

Pits and Frames—

Alpine plant seedlings or cuttings—management of frame for, i, 346.

Calendarial directions for management of, i, 3, 5, 6, 8, 9, 11, 12, 14, 15, 17, 18, 20.
 Construction (*illustr.*) and uses of, i, 204, 205; wall-frames, i, 210.

Heating frames, boilers used for—*descript.* and *illustr.*, i, 220, 221.

Pittosporum—*descript.* and cult. of hardy species, i, 313; of greenhouse and garden plants, i, 541.

Placenta of ovary—formation of, i, 53.

Plagiolanthus Lyalli (*illustr.*), **P. betulinus**, **P. Lampenii**—*descript.* and cult., i, 313.

Plane-trees—*descript.* and cult., i, 313.

Planet Jr. single wheel hoe—(*illustr.*), *descript.* and use of, i, 176.

Plant boxes or tubs—(*illustr.*), *descript.* and use of, i, 192.

Plant-breeding—extract from report on progress in, ii, 101.

Plant diseases caused by fungi—(see *Fungi*).

Plant enemies—(see title *Insect* and other *Plant Enemies*, also names of *Insects*).

Plant-food—soil as a source of, i, 132; exhaustion of in soils, i, 147 (see also *Nutrition of Plants*).

Plant-houses—

Calendarial directions for management of, i, 2, 3, 5, 7, 8, 10, 11, 13, 14, 16, 17, 19.
 Draughts—structures preventing, i, 20.

[For construction of, see *Glass-houses*—special house construction and management—see titles *Orchid-houses*, *Hot-houses*, *Greenhouses*, &c.]

Plant, living—conditions of plant-life, i, 26, 41; *descript.* and functions of green and colourless plants, microbes and symbiosis (*illustr.*), i, 29, 30; asexual and sexual conditions, i, 30, 31; flowering plants, i, 31; sensation and movement in plants (*illustr.*), i, 31.

Plant Organs, Structure and Functions—

Caulicle and stem (*illustr.*), i, 34-37.
 Cell and its contents (*illustr.*), i, 27-29.

Conditions of plant-life—structural elements, i, 26; nutrition, i, 41.

Leaf and cotyledon, i, 37-41.

Living plant (see title *Plant, living*).

Radicle and root (*illustr.*), i, 32-34.

Thallus, i, 29.

Plant-protector against slugs, &c.—*illustr.* and use of, i, 191, 192.

Plantain-lily—*descript.* and cult., i, 359.

Plants—

Absorption of nitrogen by leaves from ammonia supplied to them by the atmosphere, i, 144.

Assimilation of free nitrogen by—question of, i, 141, 142, 146.

Calendarial directions (see *Calendar of Operations*).

Classification of—explanation of botanical arrangement and terms, i, 65-67; indoor plants, meaning of term "greenhouse plants", &c., i, 523.

Decorative for house and table—names of, i, 6, 12.

Food of (see titles *Plant-food*, *Nutrition*).

Growth and branching, i, 45-48.

Humus production—table showing amount of selected constituents in certain plants, i, 139.

Movement and sensation in plants, influence of light, heat, &c., i, 31, 32.

Movement of liquids in plants, i, 44.

Sexual and asexual conditions, i, 30, 31, 48, 53.

Structure and Functions of (see title *Plant Organs*).

Various types of plants, descriptions of—Cellular and vascular, i, 29.

Dicotyledon and monocotyledon, i, 37, 39.

Flowering plants (see that title).

Green and colourless, i, 29-31.

Leguminosae order, i, 56.

Monocious and dioecious, i, 49, 50, 59.

Stamen formation—plants described as thalamifloral, calycifloral, corollifloral, epigynous, gynandrous, i, 51.

Thallophytes, i, 29, 32.

[For Hybridization, Pruning, Propagation, &c., see those titles; special plants, see generic names, also titles *Greenhouses*, *Perennials*, *Popular garden plants*, &c.]

Plasmidophora brassicae—development and treatment, i, 129.

Platanus—species, &c., *descript.* and cult., i, 313.

Platycerium—species, &c., *descript.*, cult., and *illustr.*, i, 598, 599.

Platyclinis—*descript.* of orchids, i, 580.

Platycodon—species, &c., *descript.* and cult., i, 370.

Platycrater arguta—*descript.* of, i, 313.

Platystemon californicus—*descript.* of annual, i, 397.

Platytheca galioides—*descript.* and cult., i, 541.

Pleasure-grounds—(see title *Flower-gardens* and *Pleasure-grounds*).

Plectroscelis concinna—*descript.* and treatment, i, 96, 97.

Pleroma—calendarial directions, i, 8; *descript.*, cult., and *illustr.*, i, 541.

Pliers—*descript.* and use of, i, 178.

Plum aphides—*descript.* and treatment, i, 89.

Plum grub and moth—(*illustr.*), *descript.* and treatment, i, 78.

Plum saw-fly—*descript.* and treatment, i, 77.

Plumbago—calendarial directions, i, 15, 16; *descript.* and cult. of *P. rosea* and *P. capensis* as greenhouse and stove plants, i, 541, 554; for summer-bedding, i, 636.

Plume poppies—(*illustr.*), *descript.* of, i, 351, 352.

Plummet—*descript.* and use of, i, 183.

Plums and Damsons—

Calendarial directions, ii, 533, 539, 548, 550, 554, 556.

Culture under glass—method and vars. for forcing plums, ii, 160-162; orchard-house treatment—construction of house, ii, 274, potting, &c., ii, 275, 276, ripening fruit, ii, 277, vars. suitable, ii, 278.

Descript., origin, and history of plum, damson, sloe, and bullace, ii, 150, 151, 160.

Disease and insect pests—list of insects, &c., ii, 156; treatment of forced fruit and Japanese plums, ii, 161, 162.

Gathering the fruit, ii, 155.

Illustr.—*Prunus communis*, ii, 151; American hybrid plums, ii, 152; Californian prune, ii, 153; comparative sizes of plums, ii, 156. (See also sub-headings *Lists*, *Pruning*, *Japanese plums*.)

Japanese plums—culture in U.S.A., *precis* of account on merits and vars., ii, 162, 163; confusion of nomenclature, ii, 163; lists of vars., *descript.*, and *illustr.*, ii, 163-166.

Lists of vars., *descript.*, and *illustr.*—plums, ii, 156-159, selections for special purposes, ii, 159, 160; damsons and bullaces, ii, 160, 161; forcing vars., ii, 162, 278; Japanese plums, ii, 163-166.

Packing—materials and methods of, ii, 374, 377, 378; boxes for, ii, 368, 369, 371; baskets and crates, ii, 372.

Planting trees—wall aspect, ii, 6, 8; orchard plans (*illustr.*) and directions, ii, 34, 36, 37, 38; general directions, ii, 152; trees for forcing, ii, 160, 161.

Preserving—canning, var. for, ii, 165; processes of crystallizing, ii, 350, bottling, ii, 351, drying or evaporating and vars. for, ii, 151, 155, 353-356; various modes and vars. suitable, ii, 360, 361.

Propagation—methods of, use of stones for raising stocks, &c., ii, 155, 156.

Pruning and training—standards, ii, 152; wall-trees, dwarf pyramids and bushes, cordons, ii, 153, 154; shoot and spur shortening and pinching (*illustr.*), ii, 153, 154; forcing trees, ii, 161.

Root-lifting—method of, *illustr.* of root, system of plum-tree, ii, 154.

Soil and situation—ii, 27, 151; manures, &c., for soil, ii, 155, 162. (See also sub-heading *Planting*.)

Storing—method of, ii, 155, 387, cold storage, ii, 388; shelves for stone fruits, ii, 383.

Plumule—formation of, i, 34.

Plusia gamma—(*illustr.*), *descript.* and treatment, i, 92, 93.

Plutella Cruciferarum—(*illustr.*), *descript.* and treatment, i, 84.

Podocarpus—species, &c., *descript.* and cult., i, 332.

Podophyllum—species, &c., *descript.* and cult., i, 370.

Poinsettia—calendarial directions, i, 9, 13, 15, 16; descript., cult., and illust., i, 489, 490.

Polar nuclei—formation and fertilization of, i, 53, 54.

Polemonium—species, &c., descript. and cult., i, 370; *P. coeruleum* for summer-bedding, i, 636.

Pollen-cells—formation of (illust.), i, 51, 52, 53.

Pollen-grains—formation of, i, 30, 48, 51 (illust.), 52; distribution by wind, insects, &c., i, 54; illust. of bees and flowers, and of magnified pollen-grains, i, 59; removal of, hybridization process, i, 59, 60, 62. (See also title Pollination.)

Pollen-masses in orchids—removal of (illust.), i, 62.

Pollen-tubes—course of and the fertilization of the ovule (illusts.), i, 52, 53, 60.

Pollination—process of (illust.), i, 53, 54, 60, without aid of fertilization, i, 60; interpollination of fruits, influence of foreign pollen on formation of fruit, ii, 49; report on pollination of pomaceous fruits, ii, 123, 124.

Polyanthus—calendarial directions, i, 5, 6, 11, 13; relationship, &c., between crowslip, true primrose, and polyanthus, i, 490, 491; descript. and cult. of garden plants, i, 491; spring-bedding plants, i, 630.

Polybotrya—(see *Acrostichum*).

Polydesmus complanatus—(illust.), descript. and remedies, i, 106.

Polygala—descript. and cult. of hardy shrub *P. Chamæbuxus*, i, 313, of greenhouse species, i, 541.

Polygonatum—calendarial directions, i, 3, 17, 18; species, &c., descript. of, i, 370, for forcing, i, 627.

Polygonum—descript. and cult. of hardy ornamental shrub *P. Baldschuanicum*, i, 313, of hardy perennial species, &c., i, 370, of bog or marsh plants, i, 386.

Polypodium—decorative ferns, i, 584; descript. and cult. of stove and greenhouse species (illust.), i, 598, 599, of hardy fern species, &c. (illust.), i, 607.

Polystichum—species, &c., descript. of, i, 599.

Pomalo—(see title Oranges, Lemons, &c.).

Pomegranate—descript. and cult., i, 314, in greenhouse, i, 541.

Ponds as water-gardens—(see titles Ornamental Water, Water-garden).

Pontederia—species, &c., descript., cult., and illust., i, 383, 384.

Poplar-trees—descript. and cult., i, 313, 314, use of as shelter-belts, &c., ii, 10, 33, 76.

Poppies—descript. and cult. of annual vars., &c., i, 397, of Californian poppy, i, 397; illust. of Iceland poppies, i, 648.

Poppy anemone—descript. and cult., i, 401.

Poppy mallow—descript. and cult., i, 352.

Poppyworts—descript. and cult. of, i, 375.

Popular garden plants—descripts, and illusts., i, 400-523. (For particular plant, see its title.)

Populus—species, &c., descript. and cult., i, 313, 314.

Porcellio scaber—(illust.), descript. and treatment, i, 99.

Porcupine quill rush—descript. and cult., i, 386.

Porthesia auriflva—descript. and treatment, i, 99.

Porthesia chrysorrhœa—descript. and treatment, i, 81.

Portland cement for walks, &c.—use of, ii, 27, 31.

Portulaca oleracea—(illust.), descript., uses, and cult., ii, 503.

Portulacca—descript. and cult., i, 397.

Posoqueria—descript. and cult., i, 554.

Pot-herb moth—(illust.), descript. and treatment, i, 108, 109.

Pot marigold—descript. and cult. of, i, 389.

Potash—presence of in soil, i, 134; manurial use of in leaf-mould, i, 138, as plant-food and for vine culture, &c., i, 140, 168, 169; influence of potash on vegetable physiology, i, 169, 170; composition and use of nitrate of potash, i, 170.

Potassium sulphide of sulphur—as a fungicide, ii, 44.

Potato-dibber—descript., use, and illust., i, 177; ii, 495.

Potato Disease—Descript., illust., and development of, i, 128; ii, 498, 499. Manure, influence on—results of manurial experiments on potatoes, i, 172. Origin and date of appearance, ii, 498. Plants attacked by, i, 128; ii, 498. Preventive means—use and composition of Bordeaux mixture, effect of spraying crops (illust.), and result of experiments, i, 130; ii, 499, 500. Tomatoes affected by—treatment of, ii, 338, 340, 498.

Potatoes—Calendarial directions, ii, 532, 536, 539, 541, 544, 546, 548, 552, 554; for forcing, ii, 534, 537, 539, 542. Crops potatoes may follow and be succeeded by, ii, 390. Cultivation and improvement of the potato in Europe—history and particulars as to, ii, 487-490. Descript. of formation, &c., i, 35; ii, 487, 489. Diseases—descript. and treatment of mould (sclerotia), i, 126, 127, curl and scab diseases, ii, 498. (See also title Potato Disease.) Early crops—cultural directions, ii, 496. Forcing—directions for cult. in hot-bed, pit, pot, &c., descript. of mode used by London market-gardeners, ii, 497, 498. Foreign names of, ii, 528. Improvement and deterioration—conditions affecting, &c., ii, 488, 489; raising seedlings, ii, 489; modern introductions, ii, 490. Insect pests, ii, 498. (See also title Insect and other Plant Enemies.) Lifting and storing—time and modes, non-exposure to light, protection from frost, ii, 496, 497, 566. Lists (illusts.) of vars.—modern introductions, ii, 490; for early, late, &c., crops, ii, 500-503. Manures—effect of mineral and nitrogenous manures, i, 145; results of manurial experiments with farmyard, artificial, &c., manures, i, 172; ii, 491; selection and application of various manures to suit different soils, ii, 490-492. Packing—size of barrels, &c., in America, ii, 373; directions for, ii, 566. Planting—periods for, ii, 493; distances between rows and between sets, depth for sets and result of experiment, ii, 494; modes and appliances (illust.) for trench-planting, dibber-planting, between ridges, ii, 494, 495. Potato sets—selection for propagation, ii, 492; directions for cutting, change of sets, and planting, ii, 493-495. Preserving—drying process, ii, 356. Propagation—methods, illust. of seedling, results of experiments, use of baskets (illust.), &c., ii, 492, 493. Protection from frost—method and materials used, ii, 497. Raising seedlings—method of, illusts. of seedlings, ii, 489, 492. "Seed potatoes" and "potato seeds" regarded as synonymous terms—explanation as to, ii, 488. Soil suitable and preparation of ground, ii, 490. Treatment after planting—subsequent culture, earthing-up directions, &c., ii, 495, 496. Winter crops—cultural directions, ii, 496.

Potentilla—hardy ornamental shrubs, descript. of, i, 314; hardy perennial species, &c., descript. and cult., i, 370.

Pots for plants—various forms (illusts.) and uses of, i, 190-192; pot protectors (illust.), i, 191, 192; saucers and flats, i, 192.

Poudrette—as a manure, i, 159.

Poultry—as garden friends, i, 118.

Poultry dung—as a manure, i, 160.

Powder distributor—illust. and use of, i, 190.

Prairie land—amounts of nitrogen and organic matter in, i, 150.

Preserving fruit—(see Fruit-preserving; special fruit, see its name).

Prickly pear—descript. and cult. of plant, i, 620.

Pride of California—descript. and cult. of, i, 537.

Primrose—descript. and cult. of evening, i, 367, 366, of bog plants, i, 386; relationship, &c., between crowslip, polyanthus, and true primrose, i, 490, 491; descript. and cult. of *Primula vulgaris*, i, 490, illust. of var., i, 491; spring-bedding forms, i, 630. (See also Tree primrose.)

Primula—calendarial directions, i, 41, 11, 12, 14, 18; perennial species, &c.—descript., cult., and illusts., i, 371, bog plants, i, 386, spring-bedding plants, i, 630. (See also titles Auricula, Primrose, Polyanthus, *Primula sinensis*.)

Primula sinensis (Chinese primula)—calendarial directions, i, 8; descript., origin, illust., and cult., i, 491, 492; Birmingham strain, treatment of, i, 492.

Prince's feather—descript. and cult., i, 389.

Prinos glaber, P. verticillata—descript. of, i, 314.

Pritchardia—descript. and cult., i, 611.

Privet shrubs—descript. and cult., i, 307, for winter-bedding, i, 647.

Propagating knife—illust. and use of, i, 178.

Propagating pit—(illust.), construction and uses of, i, 204, 205.

Propagation—Appliances—use of bell-glasses, &c., i, 178, 235. Budding—operation and modes of (illust.), i, 242-245. Bulbs, corms, and tubers—propagation by, i, 227. Cuttings—propagation by (see Cuttings). Diseased plants—avoidance of, i, 124. Division—propagation by, i, 227. Grafting (see that title). Inarching mode and modifications (illust.), i, 245-247. Layers, propagation by—illust. and descript. of modes of layering, i, 229-231. Leaves—propagation by, i, 235. Roots—propagation by, i, 236. Runners—propagation by, i, 228. Seeds—propagation by (see Seeds). Suckers—propagation by, i, 228. Trees and shrubs, hardy ornamental—effect of propagation, i, 285. Vegetative propagation—power of plants, i, 53. [See also names of fruits and generic titles of plants.]

Protea—species, &c., descript., cult., and illust., i, 541.

Protoids—as plant-food, i, 44.

Prothallus—formation (illust.) and uses of, i, 64, 65.

Protoplasm—formation of (illust.), i, 27; continuity of (illust.), i, 31; nitrogen essential to life of, i, 43; fusion of male and female particles of, i, 48, 53; illust. of changes in protoplasm of the cell-nucleus, i, 56.

Pruennopitys elegans—descript. of, i, 332.

Prunella—species, &c., descript. and cult., i, 371.

Prunes, dried—vars. suitable, ii, 151, 360, 361; process of drying, ii, 353-356.

Pruning—

Appliances for—descript. and illustr., i, 178, 179, 180, 181, 252.
 Art of—abuse, object, and value of pruning, i, 251, 252.
 Calendrical directions for pruning and training of fruit-trees (see Calendar of Operations in the Fruit, &c., Gardens).
 Coal-tar for dressing wounds—use of, i, 254.
 Conifers—hardy, i, 328.
 Deciduous shrubs grown for their flowers—treatment of (illustr.), i, 256, 257.
 Dwarf stocky habit—development of in hardy shrubs, &c., i, 257.
 Evergreen shrubs—outlines and treatment of flowering shrubs, i, 256.
 Finger-and-thumb method and the use of knife or saw, i, 252.
 Greenhouse plants—root-pruning, &c., i, 257, 258, 259.
 Growth of plant—consideration of mode of, i, 46.
 Large Trees—
 Branch amputation—methods (illustr.), and effects of, i, 253-255.
 Building-up of a tree—formation of trunk, &c., i, 252, 253.
 Damaged by storm and fungous disease—treatment of, i, 251, 252.
 Root-pruning (see that sub-heading).
 Season for, i, 255.
 Shape for young tree of common type of growth (illustr.), i, 252, 253.
 Old or sickly trees—(illustr.), restoration of, i, 253, 255.
 Pleasure-ground plantations, i, 274.
 Ringing—method and use of operation, i, 258.
 Root-pruning—trench system, i, 257; to increase fruitfulness of fruit-trees, i, 257; greenhouse flowering plants, i, 258; orchards, apple and pear trees, ii, 38, 68, 124.
 Stove or tropical plants, i, 546.
 [For special tree, see its name.]
Pruning bill—descript. and use of, i, 180.
Pruning knife—(illustr.), descript. and use of, i, 178.
Pruning saws—(illustr.), descript. and use of, i, 179, 181.
Pruning shears, tree-pruner, and sécateur—(illustrs.), descript. and uses of, i, 179, 180.
Prunus—hardy ornamental species, descript., cult., and illustr., i, 314, forcing plants and directions, i, 623.
Prunus Armeniaca and the history of the apricot, ii, 194.
Prunus Cerasus and **P. Avium** and the origin of the cherry, ii, 204.
Prunus communis (illustr.), **P. domestica**, &c.—origin of the plum, damson, sloe, and bullace, ii, 150, 151, 153; American forms (illustr.), ii, 151, 152.
Pseudolarix Kämpferii—descript. of, i, 332.
Pseudotsuga Douglasii—(illustr.), descript. of, i, 332.
Psila Rosæ—(illustr.), descript. and treatment, i, 102.
Psylla Pyri—(illustr.), descript. and treatment, i, 69, 70.
Ptelea trifoliata and vars.—descript. of, i, 314.
Pteris—decorative ferns, i, 584; descript. and cult. of stove and greenhouse plants, i, 600, of hardy plants, i, 607.
Pterocarya caucasica—descript. of, i, 314.
Pterostichus madidus—as garden friends, i, 116.
Pterostyrax—species of, descript. and cult., i, 314.
Ptychoraphis—species of, descript. and cult., i, 611.
Ptychosperma—descript. of palms, i, 612.
Pueraria Thunbergiana—as greenhouse plant, i, 541.

Pulmonaria—species, &c., descript. and cult., i, 371.
Pultenaea—descript. and cult. of shrubs, i, 541.
Pulvinaria camelicola—descript. and treatment, i, 92.
Pulvinaria Vitis—descript. and treatment, i, 70.
Pumpkins—(see Gourds).
Pumps—for distribution of insecticides, illustr. and use of, i, 188.
Funica Granatum—as a hardy or greenhouse plant, i, 314, 541.
Purple Osier—descript. of shrub, i, 320.
Purslane—descript., illustr., uses, and cult., ii, 503, 541; foreign names of, ii, 528.
Pyrethrum—calendrical directions, i, 6; popular plants—descript. and cult. of *P. roseum*, i, 492, illustr. and list of sorts, i, 493; plants for spring- and carpet-bedding, i, 630, 640.
Pyrus—hardy ornamental species, &c., descript. and illustrs., i, 314, 315, for forcing (illustr.), i, 623.
Pyrus baccata, **P. Malus**, and the evolution of the apple, ii, 46, 47, 48, 80.
Pyrus communis, **P. nivalis**, **P. sinensis**—(illustrs.), and the origin of cultivated pears, ii, 96, 97, 98, 101.
Pyrus germanica—(see *Mespilus*).
Pythium de-baryanum—cause and treatment, i, 128.

Q

Quassia mixture—as an insecticide, ii, 43.
Quercus—species, &c., descript. of deciduous trees, evergreen trees and shrubs, i, 315.
Quince—
 Calendrical directions, ii, 533, 536, 554.
 Descript., history, and uses of species of *Cydonia* cultivated under name of quince, ii, 259, 260.
 Gathering and storing the fruit, ii, 261.
 General culture—Japanese quince, ii, 259, Chinese quince (illustr.), ii, 259, 260, common quince (illustr.), ii, 259, 260.
 List of principal vars. cultivated for the fruit, ii, 261.
 Packing, barrels for—regulations as to size, &c., ii, 373.
 Preserving—uses and directions, ii, 259, 260, 349, 350, 360.
 Propagation—grafting quince and pear stock (illustr.), i, 237-239; use of quince stock for pear-tree propagation (illustrs.), ii, 105-108, 127, 260; vars. of pears to be double-grafted on quince, ii, 150; methods of propagation for the quince, ii, 261.
 Pruning and training, ii, 260.
Quinoa—(illustr.), descript., uses, and cult., ii, 503, 504; foreign names of, ii, 528.

R

Rabbits—damage to bark, &c., protection against, i, 70.
Radicle—structure and action (illustr.), i, 32-35.
Radish—seed quantities for cropping, ii, 39; descript., uses, and general cult., ii, 504, 505; directions for forcing, saving seeds, ii, 505; list (illustrs.) of vars., ii, 505, 506; foreign names of, ii, 528; calendrical directions, ii, 532, 536, 539, 541, 544, 546, 548, 550, 552, 554, for forcing, ii, 534, 537, 542, 556, 559; packing, ii, 567.
Railway boxes for fruit-conveyance—sizes, prices, and collection of, ii, 370.
Railway rates for fruit-conveyance, ii, 79, 135, 365.

Rain and Rainfall—

Apple culture—influence of, ii, 51.
 Combined nitrogen in—sources of the nitrogen of crops, i, 142.
 Composition of samples of rain from various districts—table showing, i, 143.
 Nitrogen, as ammonia and nitric acid, in the rainfall of three years at Rothamsted—table showing, i, 142.
Rain-gauge—(illustr.), descript. and management of, i, 24, 25.
Rakes—(illustrs.), descript. and uses of, i, 174.
Rammer—(illustr.), descript. and use of, i, 175, 177.
Ramondia—species, &c., descript., cult., and illustr., i, 372.
Rampion—descript., uses, cult., and illustr., ii, 506, 507, 544; foreign names of, ii, 528.
Rana temporaria—as garden friend, i, 119.
Ranunculus—calendrical directions, i, 19; hardy perennial species, &c., descript. and cult., i, 372; *R. Lingua* as aquatic plant, i, 383; *R. cortusae-folius* as greenhouse plant, i, 541.
Rape—foreign names of vegetable, ii, 528.
Rape-dust—as manure, i, 156.
Raphanus sativus—descript., uses, and cult., ii, 504.
Raphiolepis—hardy ornamental shrub, *R. japonica*, descript. of, i, 316; greenhouse shrubs, descript. and cult., i, 541.
Raspberries—
 Calendrical directions, ii, 533, 550, 554, 556.
 Descript., origin, &c., of cultivated forms, hybrid Rubi, &c., ii, 233, 234.
 Forcing in pots—treatment and sort suitable for, ii, 236, 237.
 Insect pests—list of, ii, 237.
 List of selected vars.—descript. and illustrs., ii, 236, 237, 238.
 Market-gardening purposes—growing for, ii, 75.
 Packing—methods of, ii, 378, crates for (illustr.), ii, 373.
 Planting—time and methods (illustr.), ii, 234, 237.
 Preserving—processes of jam-making, ii, 346-348, 358, drying, ii, 355, 356; raspberry vinegar, ii, 363; vars. suitable and modes of, ii, 363.
 Propagation methods, ii, 237.
 Pruning and training—arched training (illustr.), ii, 234, 235; espaliers (illustr.) and to rails, ii, 234, 235; trees fastened to stakes, ii, 234, 235; cordons, ii, 235, 236; mode of inducing fruit, ii, 235; summer, autumn, and winter treatment, ii, 235.
 Soil and situation, ii, 234; manurial applications, ii, 235.
 Storing—shelves for, ii, 383, ordinary method of storage, ii, 387, cold storage, ii, 388.
Raspberry beetle—(illustr.), descript. and treatment, i, 73, 78.
Raspberry vinegar—preparation of, ii, 363.
Rats—damage to fruit, seeds, &c., protection against, i, 78, 214, 383.
Rattan palms—descript. of, i, 610.
Receptacle of flower—formation of (illustr.), i, 50.
Red-bud caterpillar—(illustr.), descript. and treatment, i, 73.
Red cabbage—(see Cabbage).
Red-footed beetle—descript. and treatment, i, 89.
Red-legged garden weevil—descript. and treatment, i, 89, 90, 109.
Red spider—descript. and treatment, i, 90.
Red valerian—descript. and cult., i, 353.
Redwood tree—descript. and cult., i, 333.
Reed mace—descript. and uses of, i, 384.
Reeds—great reed, and Egyptian paper reeds, descript. of, i, 385.
Reinwardtia—descript. and illustr. of greenhouse plants, i, 541, 542.

Reproduction—The Flower—

- Conditions requisite for the production of flowers, i, 48.
- Conformation of the flower—descript. and illust., i, 49-53.
- Fertilization process, i, 53-55.
- Fruit formation—descript. and illust., i, 56.
- Growth and reproduction—difference between, i, 48.
- Hybridization process, i, 55.
- Nuclear elements—division, separation, and recombinations of (illust.), i, 55, 56.
- Pollen-cells and egg-cells—formation and union of, i, 48.
- Seed-dispersal and germination—descript. and illust., i, 56, 57.

Reseda odorata—descript. and cult., i, 397.

Reserve garden—formation of, i, 265.

Resinous trees—herbaceous grafting of, directions and illust., i, 241, 242.

Respiration—leaf function, i, 41; air as a source of plant nutrition, i, 43, 44.

Restrepia—descript. of orchids, i, 580.

Resurrection plant—descript. of, i, 602.

Retarding plants—treatment and plants suitable for retardation, i, 628.

Retinospora—nomenclature observations and generic arrangement of, i, 327, 332; forms suitable for small lawns, rockery, &c., i, 328; descript. and illust. of forms and kinds, i, 332, 333; kinds for winter-bedding, i, 647.

Rhamnus Alaternus—forms and vars., descript. and cult., i, 316.

Rhapis—calendrical directions, i, 6; descript. and cult., i, 612.

Rheum—ornamental species, &c., descript. and cult., i, 372; vars. for culinary purposes, descript. of genus, &c., ii, 507, 508. (See also *Rhubarb*.)

Rhipsalis—species, &c., descript. and cult., i, 620.

Rhizoglyphus Robini—(illust.), descript. and treatment, i, 100.

Rhizome—formation of (illust.), i, 36.

Rhizotrogus solstitialis—descript. and remedies, i, 109.

Rhodanthe—calendrical directions, i, 8; species, &c., descript., cult., and illust., i, 397, 398.

Rhodochiton volubile—as a greenhouse plant, i, 542.

Rhododendrons—

Calendrical directions, i, 3, 4, 7, 8, 18.

Greenhouse species, &c.—

Himalayan species—treatment and list of best species and hybrids, i, 497.

Javanico-malayanum section—descript., value, and cult., i, 497, 498; list of sorts (illust.), i, 498.

Multicolor hybrids—(illust.), list of, i, 498, 499.

Hardy, as Ornamental and Popular Garden Plants—

Culture—soil, propagation, &c., i, 316, 496, 497.

Descript. and illusts. of ornamental species, &c., i, 316, 317.

Descript., origin, history, and illust. of garden species, i, 493, 494.

Forcing—directions and plants suitable for, i, 623, 624.

Grouping for effect—value of shrubs in gardens, i, 494, 495.

Lists of popular garden sorts and of those for growing as standards, i, 495.

Manure for, i, 274, 286.

Pruning methods, i, 256, 257.

Transplanting—time and mode, i, 247, 248, 250, 497.

(See also *Azalea*.)

Rhodora canadensis—descript. of, i, 317.

Rhodothamnus Chamæcistus—descript. of, i, 317.

Rhodotypos kerrioides—descript. of, i, 317.

Rhopalostylis—species of, descript. and cult., i, 612.

Rhubarb—ornamental perennials, descript. and cult., i, 372.

Rhubarb for culinary purposes—descript., uses, and general cult., ii, 507; forcing method and appliances (illust.), list of vars., ii, 507, 508; foreign names of, ii, 528; calendrical directions, ii, 536, 539, 541, 544; for forcing, ii, 534, 537, 539, 556, 559; packing, ii, 567.

Rhus—species, &c., descript. and illust., i, 317.

Rhynchosites—descript. and remedies, i, 114.

Ribes—hardy ornamental species, &c., descript. and illust., i, 317, 318; forcing plants, i, 624.

Ribes grossularia and the origin of cultivated gooseberries, ii, 222.

Ribes rubrum, R. nigrum, and the origin of cultivated currants, ii, 229.

Ribes of leaves—formation of, i, 39.

Rice-paper tree—descript. of, i, 302.

Richardia—calendrical directions, i, 11; marsh plant, *R. æthiopica*, descript. and cult., i, 387; popular garden plants—descript., cult., illust., and list of species in cultivation, i, 499, 500; *R. africana* for subtropical garden, i, 645.

Ricinus—calendrical directions, i, 7, 9; annual *R. communis*, descript. and cult., i, 397; subtropical garden plants, i, 645.

Ripening of the wood—explanation of phrase, &c., i, 49.

Road-scrappings—composition of, table showing, i, 141.

Roads, construction of—pleasure-grounds, carriage drive (illust.), &c., i, 269, 271, 272; fruit-plantations—expense, materials, &c., ii, 30, 77.

Robin—as garden friend, i, 118.

Robinia—species, &c., descript. of, i, 318; forcing directions, i, 624.

Rocamboles—descript., uses, and cult., ii, 508; foreign names of, ii, 528; calendrical directions, ii, 536, 541, 548.

Rochea—descript. and cult. of, i, 620; *R. falcata* (*Crassula*)—calendrical directions, i, 8, 14; for carpet-bedding, i, 640; *R. perfoliata* for carpet-bedding, i, 640.

Rock-garden and Rockeries—

Conifers suitable for planting in rockery, i, 328.

Fern rockeries—construction of, &c., for stove and greenhouse plants, i, 585; for hardy ferns (illust.), i, 603, 604.

Flower-garden—formation of rock-garden, &c., in, i, 266-268.

Illust. of rock-garden at Kew, i, 266.

(See also *Alpine Garden*.)

Rock plants suitable for Alpine garden—list of, i, 347.

Rock rose—descript. of trailing shrub, i, 304.

Rockeries—(see titles *Rock-garden*, *Alpine Garden*.)

Rodgersia podophylla—descript. and cult., i, 372, 387.

Rodriguezia—species, &c., descript. of, i, 581.

Rollers—descript. and use of, i, 177.

Romulea—species, &c., descript. and cult., i, 372.

Rondeletia—calendrical directions, i, 19; *R. speciosa* for greenhouse, i, 554.

Roots—as garden friends, i, 117.

Root aphid—descript. and treatment, i, 109.

Root enemies—insects and other pests, descript. and illusts., i, 99-112.

Root-gall or eel-worm—treatment of, ii, 326, 341.

Root-grafting—directions, i, 242.

Root-hairs—(illust.), descript. of, i, 32, 33.

Root-lifting—method and illust. of root-system of plum, ii, 154.

Root-pruning—(see *Pruning*.)

Rootery—formation of, i, 268.

Roots—

Growth of—influence of water and conditions affecting, i, 32, 34.

Propagation by, i, 236; root-grafting, i, 242.

Root-action—explanation of absorption of water and air, &c., i, 33, 43, 44.

Structure of roots, descript. and uses of fibrous, tap, adventitious, and secondary roots, &c., i, 32-34; creeping roots (illust.), i, 36.

Rophalosiphon Dianthi—descript. and treatment, i, 86.

Rosa—

Classification of genus—explanation regarding botanical and garden roses, &c., i, 506.

Garden species, &c. (see *Roses*).

Hardy ornamental wild types—descript., illusts., and uses of, i, 318, 319, 506.

Roscheria melanochætes—descript. and cult. of, i, 612.

Rose acacia—descript. of shrub, i, 318.

Rose aphides—descript. and treatment, i, 90.

Rose-chaffer—(illust.), descript. and remedies, i, 109.

Rose-garden, formation of—site, soil, construction of rose-temple, and illusts. of roseries, i, 275, 500, 501; roses for (see title *Roses*).

Rose mildew—(illust.) development and treatment, i, 124, 126, fungicide for, i, 130.

Rose of Sharon—descript. of, i, 305.

Rose sawflies—(illust.), descript. and treatment, i, 90, 91.

Rose slug-worm—descript. and treatment, i, 94.

Rose tortrix—descript. and treatment, i, 92.

Rosemary—descript., uses, and cult., i, 319; ii, 508, 541; foreign names of, ii, 528.

Roses, Garden—

Autumnal roses—descript., illusts., and cult. of Macartney, Musk, Perpetual Moss, Noisette, Chinese, Japanese or Ramanas, hybrid Perpetual Roses, i, 511, 512; Bourbon, Tea-scented, hybrid Noisettes, hybrid Teas, i, 513, 514.

Calendrical directions, i, 3, 8, 11, 13, 15, 18, 19.

Classification of genus *Rosa*—explanations regarding botanical and garden roses, &c., i, 506.

Cultivation—position, soil, time and methods of planting, i, 500, 501; pruning (illust.), i, 501-503; pegged-down roses, i, 502; propagation methods, illusts. of grafting and budding, i, 503-506. (See also sub-headings *Autumnal*, *Summer*.)

Culture under glass, in pots, &c.—directions, i, 502, 504; vars. suitable for, i, 514.

Disease and insect pests—descript., illust., and treatment of various insects, i, 90, 91, 92, 94, 109; insects on pot-plants, i, 503; rose mildew (see that title).

Forcing—directions and sorts recommended for forcing, i, 624.

Formation of rose-garden (see title *Rose-garden*).

Illusts.—climbing rose forming arch, i, 502; pruning methods, i, 503; budding and grafting methods, i, 504-506. (See also sub-headings *Autumnal*, *Summer*.)

Lists—selections of vars. for various purposes, i, 514. (See also sub-headings *Autumnal*, *Summer*.)

Summer-bedding, i, 632.

Summer roses—descript., illusts., and cult. of Provence, Pompon, Damask and French, Moss Roses, i, 507, Alba, hybrid Chinese, hybrid Bourbon, hybrid Noisette, Scotch or Burnet, Austrian Brier, Double Yellow, Sweet Briers and Hybrids or Eglantine Roses, Boursault Roses, i, 507, 508, Ayrshire, Evergreen, Multiflora Roses, including Fairy Roses, i, 508-510, Hybrid Climbing Roses, Banksian Roses, i, 510.

Roses, wild and climbing types—descript. and illusts., i, 318, 319; use in gardens, i, 506.

Rosmarinus officinalis—descript. of, i, 319; ii, 508.

Round-leaved palm—descript. of, i, 611.

Roupala (Rhopala)—as stove plants, i, 555.

RouPELLIA grata—as a stove plant, i, 555.

Rowan-tree—descript. of, i, 314.

Royal fern—descript. and cult., i, 386, 607.

Rubus—hardy ornamental species, &c., descript. and illust., i, 319, 320; greenhouse species, descript. and cult., i, 542.

Rubus and the cult. of bramble fruit—descript. and illusts., ii, 268-270.

Rubus Idæus, R. fruticosus, and R. Idæus Leesii, and the cult. of raspberry fruit, ii, 233, 234.

Rubus phenicolasius (illust.) and the cult. of wineberry fruit, ii, 271.

Rudbeckia—species, &c., descript., cult., and illust., i, 372.

Rue—descript., uses, illust., and cult., ii, 509, 541; foreign names of, ii, 528.

Rumex—uses, cult., and descript. (illust.) of species and vars. cultivated, ii, 517.

Runner—formation of, i, 36.

Runners—propagation by, i, 228.

Ruscus—descript. of Alexandrian laurel, i, 294, of species, &c., i, 320.

Rushes—corkscrew and porcupine quill, descript. and cult., i, 386.

Russelia—descript. and cult., i, 555.

Rust disease on vines—cause and treatment, ii, 291.

Ruta graveolens—(illust.), descript., uses, and cult., ii, 509.

S

Saccharomyces glutinis—descript. of, i, 100.

Saccharum ægyptiacum—for the sub-tropical garden, i, 645.

Saccolabium—descript. of, i, 581.

Sage—drying process, ii, 356; descript., uses, and cult., ii, 509; foreign names of, ii, 528; calendrical directions, ii, 537, 541.

Sagittaria—species, &c., descript. and cult., i, 384.

Sago-palm—descript. of cycad, i, 614.

St. Bernard's lily—descript. of, i, 350.

St. Bruno's lily—descript. of, i, 350.

St. Daboe's heath—descript. of, i, 298.

St. John's wort—descript. of plant, i, 362.

Saintpaulia ionantha—(illust.), as a stove plant, i, 555.

Salicaria Phragmites—as garden friends, i, 118.

Salix—species, &c., descript. of, i, 320, for winter-bedding, i, 647.

Salpiglossis—descript. and cult. of, i, 397.

Salsafy—seed quantities for cropping, ii, 391; descript., uses, illust., and cult., ii, 509, 510; foreign names of, ii, 528; calendrical directions, ii, 539, 541, 548; packing, ii, 567.

Salt tree—descript. of, i, 303.

Saltpetre—manurial uses of, i, 170.

Salvia—calendrical directions, i, 18; descript. and cult. of hardy perennial species, &c., i, 372, of hardy annuals, i, 398, of greenhouse plants, i, 542, for spring- and summer-bedding, i, 631, 637; *S. Sclarea* and *S. officinalis* for culinary purposes—descript., uses, and cult., ii, 439, 509.

Salvinia natans—descript. of, i, 384.

Sambucus nigra, S. racemosa—as hardy ornamental trees, descript. of, i, 320; *S. nigra* and the culture of fruit, ii, 273.

Samphire—descript., illust., uses, and cult., ii, 510, 541; foreign names of, ii, 528.

Sanchezia nobilis—as a stove plant, i, 555.

Sands—for horticultural purposes, i, 141; calcareous sands as manure, i, 167.

Sandy marls—as manure, i, 166.

Sanguinaria canadensis—descript. and cult., i, 372.

Sansevieria—descript. and cult., i, 555.

Santolina—descript. of *S. Chamæcyparissus* and vars. as ornamental shrubs, i, 320, of *S. incana* for carpet-bedding, i, 640.

Sanvitalia procumbens—descript. of, i, 398.

Sap—descript. of fluid, i, 45.

Saponaria—calendrical directions, i, 14; descript. and cult. of hardy perennial species, &c., i, 372, of annual species, &c., i, 398.

Saprophytes—descript. and food of fungi, i, 29, 123.

Saraca—descript. and cult., i, 555.

Sarracenia—hardy perennial species, &c., descript. and cult., i, 373; *S. purpurea* for planting in peat and moss, i, 387; popular garden plants—descript., cult., list of species and hybrids, and illust. of, i, 514-516.

Satureja—descript., uses, and cult., ii, 510.

Satyriums—cultural requirements, i, 564.

Sauers—descript. and use of earthenware, i, 192.

Savory—descript., uses, and cult. of summer and winter savory, ii, 510, 541; foreign names of, ii, 528.

Savoy—descript., cult., and list (illusts.) of sorts, ii, 511; foreign names of, ii, 528; calendrical directions, ii, 536, 539, 541, 546, 548; packing, ii, 567.

Sawflies—as plant enemies, descript. and treatment, i, 74, 77, 85, 90, 97.

Saws—descript. and uses of pruning (illust.) and turning, i, 179, 181.

Saxe-Gothæa conspicua—descript. of, i, 333.

Saxifraga—hardy perennial species, &c.—descript., cult., and illusts., i, 373; bog or marsh plants, descript. and cult., i, 387; plants for spring- and carpet-bedding, i, 631, 640.

Scab disease on potatoes—descript. of, ii, 498.

Scabiosa—descript. and cult. of hardy perennial species, &c., i, 373, of annual and biennial plants, i, 398.

Scalding—cause and treatment of in grapes (illust.), ii, 291, in tomatoes, ii, 338, 341.

Scale insects—descript. and treatment, i, 92, on conifers, i, 328.

Scarborough lily—descript., illust., and cult. of, i, 520.

Scarlet-runners—preserving process, ii, 356; seed quantities for cropping, ii, 391; descript., uses, cult., and list (illust.) of vars., ii, 512, 513; foreign names of, ii, 528; calendrical directions, ii, 544, 546; packing, ii, 562.

Scented verbena—descript. and cult., i, 537.

Schizandra chinensis—descript. of, i, 320.

Schizanthus—calendrical directions, i, 17; hardy annual plants—descript., cult., and illust., i, 398; greenhouse plants, i, 542.

Schizoneura lanigera—(illust.), descript. and treatment, i, 67, 68.

Schizopetalon—descript. and cult., i, 398.

Schizostylis coccinea—forcing directions, i, 627.

Sciadopitys verticillata—(illust.), descript. of, i, 333.

Scilla—calendrical directions, i, 17; hardy perennial species, &c.—descript. and cult., i, 373. *S. sibirica* for spring-bedding, i, 631.

Scirpus lacustris—descript. of, i, 384.

Scissors—flower gatherer (illust.) and grape scissors, descript. and use of, i, 179, 180.

Sclerotinia—(illust.), development and treatment, i, 126, 127.

Sclerotinia pæoniæ—(illust.), descript. of, i, 130.

Scolopendrium—species, &c., descript., cult., and illust., i, 607, 608.

Scorpion senna—descript. of, i, 297.

Scorzonera—seed quantities for cropping, ii, 391; descript., uses, cult., and illust., ii, 513, 514; foreign names of, ii, 528; calendrical directions, ii, 539, 541, 544, 548; packing, ii, 567.

Scotch laburnum—descript. of, i, 307.

Scrapers, turf—descript. and use of, i, 176.

Screens for screening gravel, &c.—descript. of, i, 193.

Screw-pines—as stove plants, descript. and cult., i, 553.

Scurvy grass—foreign names of, ii, 528, cult. of, ii, 541.

Scutellaria—calendrical directions, i, 19; descript. and cult. of, i, 555.

Scythe—illust. of scythe-snaths, i, 179; descript. and uses of scythes, i, 181.

Sea buckthorn—descript. and use of, i, 304, 336.

Sea holly—descript., cult., and illust. of, i, 358.

Sea-kale—crops sea-kale may follow and be succeeded by, ii, 390; descript. (illust.), soil, &c., general cult., and forcing directions, ii, 514, 515; taking the crop, saving seed, vars. of, ii, 510; foreign names of, ii, 528; calendrical directions, ii, 539, 541, 556, for forcing, ii, 534, 537, 539, 557, 559; packing, ii, 567.

Sea-lavender—descript. and cult. i, 375, 399.

Sea-pinks—descript. of, i, 351.

Sea-side and Town Trees and Shrubs—Chalk soils—

Preparation for planting in, i, 337.

Trees, shrubs, and climbing plants which will thrive in, i, 337, 338.

Sea-side planting—

Advice on selection of trees, &c., i, 335, trees and shrubs specially successful in growth, i, 336.

Hardy conifers suitable for exposed positions on the coast, i, 328.

Lists of trees and shrubs that withstand the sea-breeze, i, 335, when partially sheltered, i, 336.

Position and protection of trees and shrubs—planting screen border of trees, &c., and artificial means of protection, i, 335-337.

Situations near the sea favourable to tender plants, i, 283, 335.

Town planting—

Guards for trees—(illusts.), uses of, i, 338.

Lists of trees and shrubs suitable for large towns, i, 284, for streets, town gardens, parks, &c., i, 339, 340.

Preparation of ground for roots in streets and elsewhere, i, 338.

Sea-weeds—manurial uses, i, 156.

Seafortia—(see Archontophoenix).

Sécateur pruning shears—(illust.), descript. and use of, i, 179, 180.

Sedge—descript. and cult. of hardy herbaceous perennials, i, 353, of marsh or bog plants, i, 385.

Sedum—species, &c., descript. and cult., i, 374, for carpet-bedding, i, 640.

Seed enemies—insect and other pests (illusts.), descript. and treatment, i, 74-79.

Seedling-plant—production and growth of, i, 48, 57; "damping-off" disease, cause and treatment, i, 128.

Seeds—

Annuals, hardy and half-hardy—methods of sowing, &c., i, 387, 388.

Dispersal and germination—reproduction process, i, 56, 57, 225.

Hybridization—production of seeds which will "come true", isolation method, i, 62; production of double-flower seeds, i, 63.

Kitchen-garden—quantities required for cropping an acre, ii, 391.

Lawn—grass seeds suitable for, i, 278.

Seeds, Propagation by—

General remarks on—conditions necessary for successful propagation, i, 223.
Maturity and perfection of seeds, i, 223.
Plants showing fungous disease—precaution against using seeds of, i, 124.
Preserving seeds, i, 224.
Sowing—time for, i, 224, 225; modes for open-air and indoor sowing, i, 225, 226.
[For special fruit, see its name—plants, see generic titles.]

Selaginellas—for rockeries, i, 585; *descript.*, *cult.*, list of species, &c., and *illustr.*, i, 601-603.

Selenipedium—species, &c., *descript.* of, i, 581.

Self-heal—*descript.* and *cult.*, i, 371.

Semasia Wöberana—(*illustr.*), *descript.* and *treatment*, i, 70.

Sempervivum—*descript.* and *cult.* of hardy perennial species, &c., i, 374, of succulent plants (*illustr.*), i, 620, 621, for spring- and carpet-bedding, i, 631, 640.

Senecio—*descript.* and *cult.* of hardy perennial species, &c., i, 374, of hardy annual, i, 398, of greenhouse plants (*illustr.*), i, 542, of subtropical garden plants, i, 645.

Sensitive plant—*descript.* and *cult.*, i, 553.

Sequoia—species, &c., *descript.* and *cult.*, i, 333.

Sewage manure—composition and uses of, i, 159.

Shaddock—(see title Oranges, Lemons, &c.).

Shallots—crops shallots may follow and be succeeded by, ii, 390; *descript.*, *uses*, *cult.*, and *vars.* of, ii, 516; foreign names of, ii, 528; *calend.* directions, ii, 536, 539, 541, 548, 559, 554, 556.

Shanking disease in vines—cause and *treatment*, ii, 291.

Shears—(*illustr.*), hedge, lopping, garden-edging, pruning—*descript.* and *uses* of, i, 178-180.

Sheep-laurel—*descript.* of, i, 306.

Sheep's-dung—*cult.* of mushrooms, ii, 464.

Sheep's scabious—*descript.* of, i, 363.

Shell-marls—as manure, i, 167.

Shepherdia argentea—*descript.* of, i, 320.

Shield ferns—*descript.* of, i, 605.

Shooting stars—*descript.* and *cult.* of, i, 357.

Shortia—species, &c., *descript.*, *cult.*, and *illustr.*, i, 374.

Shovels—*descript.* and *illustr.*, i, 173, 174.

Shrubs—(see titles Trees and Shrubs, Hardy Trees and Shrubs, Sea-side and Town Trees and Shrubs, &c.; for special shrubs, see generic titles).

Sicilian beet—for the subtropical garden, i, 643.

Sidalcea—species, &c., *descript.* and *cult.*, i, 374.

Side-saddle flowers—*descript.*, *illustr.*, and *cult.* of, i, 514-516.

Sieves—*descript.* and *use* of, i, 193.

Silene—*calend.* directions, i, 5, 6, 14, 17; *descript.* and *cult.* of hardy perennial species, &c., i, 374, of annuals, i, 398.

Silpha opaca—*descript.* and *treatment*, i, 79.

Silphium—species, &c., *descript.* and *cult.*, i, 374.

Silver berry—*descript.* of shrub, i, 300.

Silver ferns—*descript.* of, i, 594.

Silver Y moth—(*illustr.*), *descript.* and *treatment*, i, 92, 93.

Sinapis alba—*descript.*, *uses*, and *cult.*, ii, 466, 467.

Siphonophora Lutea and **S. circumflexa**—*descript.* and *treatment*, i, 73, 74.

Siphonophora Rosa, **S. rosarium**—*descript.* and *treatment*, i, 90.

Sitona crinita, **S. lineata**—(*illustr.*), *descript.* and *treatment*, i, 87, 88.

Sitta europea—as a garden friend, i, 119.

Sium Sisarum—*descript.*, *uses*, and *cult.*, ii, 516.

Skimmia—species, &c., *descript.*, *cult.*, and *illustr.*, i, 320, 321, for winter-bedding, i, 647.

Skirret—*descript.*, *uses*, and *cult.*, ii, 516, 547; foreign names of, ii, 528.

Skunk flower—*descript.* and *cult.* of, i, 387.

Slaty or stony marls—as manure, i, 166.

Sleeping disease in tomatoes—cause and *treatment*, ii, 341.

Slime fungus on tomatoes—cause and *treatment*, ii, 341.

Sloes—*use* of for sloe gin, ii, 364. (See also title Plums and Damsons.)

Slug-worms—(*illustr.*), *descript.* and *treatment*, i, 94.

Slugs—*descript.* and *treatment* as leaf-enemies, i, 93, as garden friends (*illustr.*), i, 121, 122.

Small Ermine moth—(*illustr.*), *descript.* and *treatment*, i, 94, 95.

Smilax—*calend.* directions, i, 6; *descript.* and *cult.* of hardy shrubs, i, 321, of greenhouse species, i, 542.

Smoke-tree—*descript.* of, i, 317.

Smyrnium olusatrum—*descript.* and *uses*, ii, 391.

Snails—as leaf-enemies, *descript.* and *treatment*, i, 93.

Snake millipedes—as fruit and seed enemies, *descript.* and *treatment*, i, 78.

Snaphragon—*descript.*, *cult.*, and *illustr.* of, i, 401, 402; for summer-bedding, i, 633.

Snow-in-summer—(*illustr.*), *descript.* of, i, 311.

Snowball-tree—*descript.* of, i, 325, for forcing, i, 625.

Snowberry shrub—*descript.* of, i, 321.

Snowdrop—*calend.* directions, i, 7; species, &c.—*descript.*, *cult.*, and *illustr.*, i, 359, for forcing, i, 627, for spring-bedding, i, 630.

Snowdrop tree—*descript.* of, i, 303.

Snowflake—*descript.* and *cult.*, i, 363, for spring-bedding (*illustr.*), i, 630.

Snowy fly—*descript.* and *treatment*, i, 95.

Soapwort—*descript.* and *cult.* of hardy perennials, i, 372, of hardy annuals, i, 398.

Sobralia—*calend.* directions, i, 7, 8, 15; species, &c., *descript.* of, i, 581.

Soda—manurial uses of nitrate of, i, 170.

Soil—as a source of food, water, and air to plants, i, 41-43.

Soils—

Azalea (see that title).

Calend. directions for preparation, &c., of flower-, fruit-, and kitchen-gardens (see *Calendar of Operations in the Flower-garden*, &c.).

Capillary power of soils, i, 135, 136.

Carnation culture—composition of soil suitable for, i, 140.

Chalk soils (see that title).

Ferments of the soil—*descript.* of, i, 134.

Fertility of—causes affecting, i, 149, 150.

Flower-gardens—soil for, preparation of ground, i, 141, 260, 261, 269.

Formation of soil and its properties, i, 131-134; elements necessary to plant-nutrition, analyses of soil, &c., i, 41-43.

Fruit- and kitchen-garden—soil suitable and improvement measures, ii, 2-4, 29, 30; for fruit-tree borders, ii, 27-29.

Greenhouse and conservatory plants, i, 524, 527; ferns, i, 141, 583.

Horticulture, different soils used in—composition of various moulds, &c., tables illustrating, i, 138-141.

Humus or vegetable mould (see sub-heading Horticulture, also title Humus).

Nitrification—process of, analysis of drainage water, &c., i, 132; active nitrification without aid of manure, trituration as method of causing, i, 133; rate of, temperature a factor in determining, i, 134.

Nitrogen and organic matter in various soils—table showing amounts, &c., i, 150. (See also title Nitrogen.)

Soils (cont.)—

Orchard soil—analysis of, improvement measures, &c., ii, 33, 34.

Orchid potting, i, 562, 563, 564.

Oxidation of—essential conditions to, i, 134; temperature a factor in determining rate of, i, 134.

Palms—soil suitable for, i, 141, 609.

Plant-food—soil as a source of and elements in soil necessary to plant-nutrition, i, 41-43, 132; exhaustion of plant-food in soils, i, 147, 148.

Sands—selection of and table showing composition of road-scrappings, i, 141.

Stove or tropical plants and ferns, i, 141, 545, 583.

Tillage of—preparation for various seasons, i, 133; some reasons for tillage, i, 148, 149.

Vines—analysis of soil from Spain, and composition of soil suitable for, i, 140, 141, 281, 292.

Water—absorptive and retentive power of soils and their constituents, i, 134, 135; capillary power of soils and percentage amounts of water imbibed, i, 135, 136.

[See also generic names of plants.]

Solandra grandiflora—as a stove plant, i, 555.

Solanum—*calend.* directions, i, 7, 9, 11, 15; *descript.* and *cult.* of hardy ornamental plant, i, 321, of greenhouse species, i, 542, of stove species (*illustr.*), i, 555, of plants for subtropical garden (*illustr.*), i, 645.

Solanum Melongena—(*illustr.*), *descript.*, origin, uses of fruits, and *cultural* directions, ii, 441, 442.

Solanum tuberosum—*descript.* and history of *cult.*, ii, 487; *cult.* (see Potatoes).

Solar radiation from morning to evening—table showing progress of, ii, 6.

Soldanella—species, &c., *descript.* and *cult.*, i, 374.

Solomon's seal—(see Polygonatum).

Solomon's tears—*descript.* of plant, i, 356.

Sonchus lacinatus—for the subtropical garden, i, 646.

Sonerila—species, &c., *descript.* and *cult.*, i, 555.

Soot—as a manure, i, 157.

Sophora japonica—*descript.* of, i, 321.

Sophronitis—*descript.* and *cult.* of, i, 581.

Sorrel—*uses*, *cult.*, and *descript.* of species and *vars.* cultivated, ii, 517, 541; foreign names of, ii, 528; wood-sorrel (see that title).

Southernwood—*descript.* of shrub, i, 289.

Spades—*descript.* and *illustr.*, i, 173, 174, of turf-spade, i, 175, 176.

Spanish broom—*descript.* of, i, 321.

Sparaxis—*calend.* directions, i, 19; species, *descript.* and *cult.*, i, 543.

Sparmannia—*descript.* and *cult.* of greenhouse shrubs, i, 543, of *S. africana* for subtropical garden, i, 646.

Sparrows—as fruit and seed enemies, i, 75, as garden friends, i, 117.

Spartium junceum—*descript.* of, i, 321.

Spathiphyllum—species, &c., *descript.* and *cult.*, i, 555.

Spear-mint—*descript.*, *uses*, and *cult.*, ii, 462.

"Species"—botanical meaning of term, i, 66.

Specularia—species, &c., *descript.* and *cult.*, i, 399.

Speedwell—(*illustr.*), *descript.* and *cult.* of, i, 377.

Spergula pilifera—for carpet-bedding, i, 640.

Sphærella fragariæ—(*illustr.*), *descript.* of, i, 130.

Sphærogyne latifolia—as a stove plant, i, 555.

Sphærotheca pannosa—(*illustr.*), development of, i, 124, 125.

Spiders—(*illustr.*), as garden friends, i, 122.

Spiderwort—*descript.* and *cult.* of, i, 354, 375.

Spigelia marilandica—descript. and cult., i, 374.

Spinach—crops spinach may follow and be succeeded by, ii, 390; seed quantities, ii, 391; descript., cult., and list (illust.) of vars., ii, 517, 518; foreign names of, ii, 528; calendarial directions, ii, 532, 536, 539, 541, 544, 546, 548, 550, 552; packing, ii, 567; Mountain spinach (see Orach), New Zealand spinach (see that title).

Spinacia oleracea—(see Spinach).

Spindle-tree—descript. of, i, 301.

Spiræa—
Calendarial directions, i, 3, 17, 18.
Hardy herbaceous perennials—descript. and cult. of *Astilbe* species, &c., i, 351, of meadow-sweet, i, 375, of bog or marsh plants, i, 387.
Hardy ornamental shrubs—descript., cult., and illusts., i, 321, 322, for forcing, i, 624, for winter-bedding, i, 647.
Spiræa (*Hoteia*)—forcing sorts and directions, i, 627; retarding growth of, i, 628. [See also *Neillia*, *Exochorda*, and *Hoteia*.]

Spittle-fly—(illust.), descript. and treatment, i, 95, 96.

Sponge leaf—descript. and cult. of, i, 384.

Sporangium—formation of, i, 51.

Spores—vegetative propagation of plant by means of, i, 53; structure and functions (illust.), i, 64; fungus spores, i, 123, 124.

Sports or bud variations—appearance of, i, 55, 65.

Sprayers for distribution of insecticides, &c.—illusts. and use of, i, 188; ii, 40-42.

Spraying Fruit-trees—
Apparatus for—descript. and illusts. of various machines, &c., i, 188; ii, 40-42.
Insecticides and fungicides—application of, methods and washes, &c., for, ii, 42-44.
Necessity for—eradication of insect and fungus pests, ii, 40.

Spring-bedding—directions and plants suitable for, i, 628-631; illust. of spring-bedding at Belvoir Castle, i, 628.

Sprouts—(see Brussels-sprouts).

Spruce—pruning, i, 256; winter-bedding vars., i, 647. (See also *Abies*, *Picea*.)

Spruce-gall aphid—descript. and remedy, i, 328.

Squashes—(see Gourds).

Squill—descript. and cult. of, i, 373.

Stachys lanata—for spring-bedding, i, 631.

Stachys tuberosa—descript., illust., uses, and cult. of, ii, 438.

Stachyurus præcox—descript. of, i, 321.

Stag's-horn Sumach—descript. of, i, 317.

Stakes and Staking—
Fruit-trees—method of staking (illust.), ii, 57, 58; expenses, ii, 77.
Marking out lines for walks, &c.—stakes for, i, 182.
Perennials and annuals, i, 341, 388.
Sea-side and town trees and shrubs, i, 337, 338.

Stamens—formation of, i, 30, 49, 50, 51 (illust.), 52; arrangement of stamens for protection of pollen from injurious agencies, &c. (illusts.), i, 51, 52, 54; petaloid stamens in double flowers (illust.), i, 63.

Standard-tree pruner—(illust.), descript. and use of, i, 180.

Stangeria paradoxa—descript. and cult. of, i, 613, 614, 615.

Stanhopea—descript. and cult. of orchids, i, 581.

Stapelia—species, &c., descript. and cult., i, 621.

Staphylea colchica, *S. pinnata*, *S. trifolia*—descript. of, i, 322; forcing *S. colchica*, i, 624.

Star of Bethlehem—descript. and cult., i, 367, 368.

Starling—as garden friend, i, 118.

Statice—descript. and cult. of perennial species, &c., i, 375, of annual species, &c., i, 399, of greenhouse species, &c., i, 543.

Statuary—for garden decoration, i, 268.

Stauntonia—calendarial directions, i, 15; descript. of *S. hexaphylla*, i, 322.

Steam—heating structures by means of, i, 222.

Stellaria graminea aurea—for carpet-bedding, i, 640.

Stem—structure (illusts.) and functions, i, 34-37; various forms of (illust.), i, 35; 36; nodes and internodes of stem, leaf-formation, i, 38, 39.

Stem-borers—insect and other pests, descript. and illusts., i, 112-114.

Stem-boring weevils—descript. and treatment, i, 114.

Stephanandra flexuosa—descript. of, i, 322.

Stephanotis—calendarial directions, i, 9, 12; descript. and cult. of *S. floribunda*, i, 556.

Sterility in fruit-trees—(see Fruit-trees, sub-heading Fruitfulness).

Sternbergia—species, &c., descript., cult., and illust. of, i, 375.

Stevensonia grandiflora—descript. and cult. of, i, 612.

Stigma—formation of (illust.), i, 52, 53; pollination process (illust.), i, 53, 60.

Stock—calendarial directions, i, 3, 5, 8, 10, 12, 14; descript. and cult. of Virginian stock, i, 394, of annual species, &c. (illust.), i, 394, 395, of summer-bedding vars., i, 635.

Stocks and their effects—
Apple propagation, ii, 54, 55—illusts., ii, 53, 55.
Apricot propagation—use of mussel and plum stocks, ii, 200.
Cherry propagation, ii, 207.
Peach and nectarine propagation—use of pear, plum, and almond stocks, ii, 188, 189.
Pear propagation—use of quince, and merits and effects (illusts.) of various stocks, i, 237; ii, 127, 128, 150; intermediate stocks and double-grafting (illust.), ii, 107, 108.
Plums and damson propagation—use of stones for raising stocks, &c., ii, 155.

Stomata—formation of (illust.), i, 39, 40.

Stone-crop—descript. and cult. of plant, i, 374.

Stone-fruit—formation of (illust.), i, 56.

Storing Fruits—
Attention to and necessity of—general remarks on, ii, 380.
Cold storage—use of and prices in America, machinery employed (illust.) and results of experiments in Britain, ii, 387, 388.
Conditions necessary for keeping fruit, arrest of fermentation, seasonal influences, &c., i, 210-212, 214; ii, 380-382.
Conveniences for—use and construction of stages, shelves, trays (illusts.), and drawers, ii, 69, 70, 382, 383.
Kinds and varieties of fruits suitable for storage, ii, 380, 386, 387.
Lawton process of sterilizing the air of fruit-room, ii, 384, 385.
Light—effect of admission of, i, 212, 214; ii, 385.
Preservative or non-conducting materials—descript. and use of, ii, 383.
Preserved fruits, jams, &c., ii, 348, 356.
Ripening of fruit—explanation of process, ii, 380, 381.
Using storehouse for other garden-products—disadvantages of, ii, 385.
[For special fruit, see its name—Fruit-room construction, temperature, &c.; see title Fruit-room.]

Storms—damage to trees and shrubs, pruning and protection against, &c., i, 252, 336, 337.

Stove or Tropical House and Plants—
Construction of house and intermediate house, i, 544, 545.
Culture of plants—conditions necessary, i, 544.
Ferns—stove and greenhouse (see Ferns).
General treatment—ventilation, heating, shading, i, 544; temperature, firing, and air-giving, i, 545, 546; potting, pruning and training, watering and syringing plants, i, 545, 546.
Insect pests, &c.—treatment of, i, 546.
List of plants—descript., cult., and illusts., i, 546-556.
Soil—composition of soil suitable, &c., i, 141, 545.

Strata—descript. and illusts. of various strata, drainage of kitchen-garden, ii, 19-21.

Stratiotes aloides—descript. of, i, 384.

Strawberries—
Alpine—origin, ii, 238; descript., and special cultural requirements, ii, 248, 249.
Calendarial directions—outdoors, ii, 533, 536, 539, 542, 544, 548, 550, 552, 554; for forcing, ii, 535, 537, 539, 543, 545, 552, 557, 559.
Disease and insect pests—leaf fungus (illust.), i, 130; mildew treatment, ii, 243; list of insects, ii, 245.
Forcing—construction of house for (illust.), i, 208; removal of young fruits, ii, 241; choice and establishment of runner-plants, ii, 242; degree of growth and influence of forcing plants, ii, 242; temperature and treatment for pot-plants, for plants in rows, and in outside frames, ii, 242-244; Alpine and perpetual strawberries, ii, 249, 250.
Garden strawberries—descript. and origin of, ii, 238.
Gathering the fruit—time and method, ii, 241, 243.
General culture—treatment of runners and foliage, materials for mulching, &c., ii, 240, 241.
List of vars.—descript. and illusts., ii, 245-248; Alpine vars., ii, 249; perpetual vars., ii, 250.
Male, female, and hermaphrodite plants and the presence of sterility—observations regarding, ii, 241, 242.
Manure—effect of various manurial experiments, i, 171; application of, ii, 240, 241.
Market-gardening purposes—profit in growing for, ii, 75.
Packing and grading—instructions, ii, 377, 378; packages for (illust.), ii, 368, 372, 373.
Perpetual strawberries (illust.)—descript., origin, and cultural requirements, ii, 238, 249-251.
Planting—time, method, and treatment of plants, ii, 239, 241; renewing the plantations, system of, ii, 241.
Preserving—time to gather fruit for, ii, 241; processes of jam-making, ii, 346-348, 358, drying fruit, ii, 355, 356; vars. suitable and modes of, ii, 362.
Propagation—methods of and care of young plants, ii, 244, 245.
Soil and situation, ii, 239.
Storing—shelves for, ii, 383; method of, ii, 387; cold storage, ii, 388.

Strawberry-leaf fungus—(illust.), i, 130.

Strawberry tree—descript. and cult., i, 289.

Stream—utilization of in rock-garden, i, 267; in pleasure-grounds, i, 280-282, in water-garden (illust.), i, 379.

Streets—trees and shrubs suitable for planting in, i, 339, 340.

Strelitzia—descript. and cult. of greenhouse and stove plants, i, 543, 556.

Streptocarpus—calendarial directions, i, 7, 10; descript., origin, and cult., i, 516; insect pests, i, 517.

Streptosolen—as greenhouse plants, i, 543.

Strix flammea—as garden friends, i, 117.

Strobilanthes—species, &c., descript. and cult., i, 556.

Structures—(see Garden Structures).

Struthiopteris—(see Onoclea).

Stuartia—species, &c., descript., cult., and ill., i, 322.

Sturnus vulgaris—as garden friend, i, 118.

Style—formation of (illust.), i, 52, 53, 54; fertilization of ovule (illust.), i, 53, 60.

Stylophorum—species, &c., descript. and cult., i, 375.

Styrax—species, &c., descript. and ill., i, 322.

Subtropical Garden and Plants—
Choice and culture of plants—shelter, &c., i, 265, 641; plants for terrace gardens, i, 641; uses of different plants, i, 642; plants for isolated positions on grass, &c., i, 642.
Formation of garden—aspect and situation, preparation of beds and ground, i, 261, 265, 641, 642.
Illust. of garden in Hants, i, 641.
List of plants for subtropical gardening in Great Britain—descript., ill., and cult., i, 642–646.

Succulent Plants—
Cacti and their treatment—illust. of Mexican cacti, i, 616.
Cultivation—native habitats of plants, watering, housing, &c., i, 615, 616.
Explanation of term “succulent plants”, i, 615.
List of useful and best-known plants—descript., cult., and ill., i, 617–621.

Suckering iron—(illust.), descript. and use of, i, 175, 177.

Suckers—propagation by, i, 228; fig and gooseberry propagation, ii, 218, 226.

Sugar-beet crops—effect of mineral and nitrogenous manure, i, 144, 145.

Sugar-cane disease in West Indies—cause of, i, 124.

Sulphur—as a fungicide, i, 129; descript. (illust.) of sulphurator, i, 189, 190.

Sulphur showers and the fertilization of plants, i, 54.

Sulphurator—(illust.), descript. and use of, i, 189, 190.

Summer-bedding—
Designs and effect—selection of plants and ill., i, 632.
General treatment, preparation of beds, cutting-time, &c., i, 632, 633.
List of selected plants—descript., ill., and directions for propagation, i, 633–637.

Summer-chafer—descript. and remedies, i, 109.

Summer-houses—construction of, i, 276, 277.

Sun beetles—as garden friends, i, 116.

Sun-burning—bark of peach-trees, cause and treatment, ii, 179.

Sun plant—descript. and cult., i, 397.

Sundews—cult. of in boggy places, i, 385.

Sunflowers—descript. and cult. of perennials, i, 367, of annuals (illust.), i, 392.

Sun's rays, action of—consideration of in the formation of fruit- and kitchen-garden, tables showing progress of solar radiation, &c., ii, 5, 6, 8.

Swainsona—as greenhouse plants, i, 543.

Swallows—as garden friends, i, 118.

Swan River daisy—(illust.), descript. and cult. of, i, 389.

Sweet Alyssum—for summer-bedding, i, 633.

Sweet bay tree—descript. of, i, 307.

Sweet flag—descript. of plant, i, 384.

Sweet-gale—descript. of shrub, i, 310.

Sweet pea—calendarial directions, i, 3, 5, 7, 12; descript., cult., and ill., i, 393; for summer-bedding, i, 635.

Sweet Sultan—calendarial directions, i, 5; descript. and cult., i, 390.

Sweet William—descript. and cult., i, 356.

Sycamore-tree—descript. of species and vars., i, 286, 287.

Sylvia trochilus, S. hippolais—as garden friends, i, 118.

Symbiosis—(illust.), descript. of, i, 30.

Symphoricarpus racemosus and other species—descript. and cult., i, 322, 323.

Symphandra—species, &c., descript. and cult., i, 375.

Symplocarpus foetidus—descript. and cult., i, 387.

Sympodes—growth of, i, 46.

Syringa—Philadelphus species, &c. (syringa of gardeners), descript. of, i, 311, 312; hardy ornamental species, &c., descript. and ill., i, 323; forcing plants, directions and ill., i, 336, 624, 625.

Syringes for watering, &c.—(illust.), descript. and use of, i, 190.

Syringing—stove or tropical plants, i, 546. (See also names of plants and title Spraying Fruit-trees.)

T

Tabernaemontana coronaria flore-pleno—as a stove plant, i, 556.

Table decoration—plants suitable, i, 12. (See also title Floral Decoration.)

Tables for sorting and packing fruit, &c.—designs suitable, ii, 367.

Tacsonia—descript. and cult., i, 543.

Tagetes—descript., cult., and ill., i, 399; for summer-bedding, i, 637.

Talauma—descript. of plants, i, 543.

Tallies—(illust.), descript. and use of, i, 194.

Tamarisk—descript. of shrub, i, 323.

Tamarix—species, &c., descript. and cult., i, 323.

Tanacetum vulgare—descript., uses, and cult., ii, 518.

Tansy—descript., uses, and cult., ii, 518, 541; foreign names of, ii, 528.

Tape grass—descript. and cult. of, i, 384.

Taraxacum Dens Leonis—uses and cult. of, ii, 441.

Tarragon—descript., ill., uses, and cult., ii, 518; foreign names of, ii, 528; calendarial directions, ii, 534, 541.

Tarsonymus—descript. and treatment, i, 80.

Taxodium distichum—descript. and cult. of, i, 333.

Taxus—species, &c., descript. and cult., i, 333, 334; for winter-bedding, i, 647.

Tea-tree—descript. of, i, 308.

Tecoma—calendarial directions, i, 4, 15; descript. and cult. of hardy shrub T. radicans, i, 323; of greenhouse shrubs (illust.), i, 543.

Telegraph plant—descript. and cult., i, 549.

Temperatures—
Calendarial directions for plant-houses, &c. (see Calendars of Operations in the Flower-garden and in the Fruit- and Kitchen-gardens).
Forcing hardy shrubs, i, 621.
Fruit-room (see that title).
Greenhouse and conservatory, i, 524, 526, 583.
Orchid-houses—table of temperatures and directions, i, 562; damage by excessive high temperature, native habitats of species, i, 557, 558.
Palm-houses, i, 609.
Production of flowers—regulation of, i, 49.
Propagation by seed and cuttings—influence and regulation of, i, 225, 234.
Retarding plants, i, 628.
Soil—processes of oxidation and nitrification, i, 134.
Stove or tropical houses, i, 545, 583.
Succulent plants, cacti, &c., i, 616.
Tables of mean temperature of March, latitude Paris to Wick, i, i; ii, 531.

Temperatures (cont.)—

[See also titles Heating, Vines, Tomato, &c.—special fruit-houses, see names of fruits.]

Temples in pleasure-grounds—rose-temple, i, 275; construction of, i, 277.

Tennis lawn—(see Lawn-tennis grounds).

Tephritis Onopordinis—(illust.), descript. and treatment, i, 82, 83.

Terms used in classification of plants, &c.—explanation of, i, 65–67.

Terrace gardens—stately foliage plants suitable for, i, 641.

Testacella halotidea (illust.), **T. Maugei**—as garden friends, i, 112.

Tetragonia expansa—(illust.), descript., uses, and cult., ii, 467.

Tetranychus telarius—descript. and treatment, i, 90.

Tetradlea—descript. of plants, i, 543.

Teucrium polium—for carpet-bedding, i, 640.

Thalamus of flower—(illust.), formation of, i, 50.

Thalla dealbata—descript. and cult., i, 384.

Thalictrum—species, &c., descript. and cult., i, 375.

Thallophytes—descript. of, i, 29, 30, 32.

Thallus—descript. of, i, 29.

Thamnocalamus—as aquatic plants, i, 381.

Theophrastia imperialis—as a stove plant, i, 556.

Thermometers—
Air—descript., ill., and management of, i, 22, 23, 25; method of making screen for (illust.), i, 22.
Earth—descript. and ill., of Symon's, i, 23, 24.

Thistle, herring-bone—use of in subtropical garden, i, 643.

Thorn-trees—descript. and uses of, i, 298.

Thrinax—species, descript. and cult., i, 612.

Thrips—as leaf-enemies, descript. and treatment, i, 96.

Thrushes—as garden friends, i, 118.

Thuja—species, &c., descript., cult., and ill., i, 334; for winter-bedding, forms of T. occidentalis and Thujopsis, i, 647.

Thujopsis—(see Thuja).

Thunbergia—calendarial directions, i, 18; descript. and cult. of hardy annual species, &c., i, 399, of stove plants, i, 556.

Thunia—species, &c., descript. of, i, 581.

Thyme—drying process, ii, 356; uses and cult. of common and lemon thyme, ii, 519, 541; foreign names of, ii, 528.

Thymus—descript. and cult. of ornamental perennials, i, 375, of T. vulgaris and T. citriodorus for culinary purposes, ii, 519.

Thysacanthus rutilans—calendarial directions, i, 7, 19; descript. and cult., i, 556.

Tiarella cordifolia—species, &c., descript. and cult., i, 375.

Tibouchina—descript. and cult., i, 556.

Tiger beetles—(illust.), as garden friends, i, 116.

Tigridia—species, &c., descript., cult., and ill., i, 375, 376.

Tilla—species, &c., descript. of, i, 323, 324.

Tillage of Soils—
Active nitrification of soil without aid of manure, method of trituration, i, 133.
Fertility of soils—causes affecting, i, 149, 150.
Some reasons for, i, 148, 149.

Tillandsia—descript., cult., and ill., i, 556.

Tilths—agricultural and horticultural, range of, i, 149.

Timber—plantation of on estates, i, 273, 274.

Tipula Oleracea, T. paludosa, T. maculosa—(illust.), descript. and treatment, i, 103.

Tipula reptans—treatment of cocoons of on water-cress, ii, 441.

Tissue—formation of various tissues (illustr.), i, 28, 29; fundamental tissue of stem or branch, i, 36, 37.

Titmouse—as enemy or friend in garden, i, 75, 117, 118.

Toadflax—descript. and cult. of, i, 364.

Toad-flower—descript. and cult. of, i, 621.

Toads—as garden friends, i, 119.

Tobacco plant—calendrical directions, i, 7; descript. and cult., i, 396, for subtropical garden, i, 645.

Todea—for Warden cases, i, 585; sections of genus, descript. and illustr., i, 600.

Tom Thumb—descript. of plant, i, 390.

Tomato—
Autumn and winter crops grown wholly or partially under glass—treatment of, ii, 338-340.
Calendrical directions—outdoor, ii, 544, 546, 548, 550, 554; for forcing, ii, 534, 537, 539, 544.
Culture in open-air—
Conditions for successful culture, ii, 331.
Market-growers' methods and profits, ii, 333, 334.
Planting—positions, time, and methods, ii, 332.
Pruning and training—side-shoots (illustr.), ii, 332; removal of leaves (illustr.), ii, 333; use of stakes, &c. (illustr.), ii, 334.
Raising the plants—time and method of sowing seed and treatment of seedlings, ii, 331, 332; hardening off for fruiting quarters, ii, 332.
Ripening of fruit—time for, treatment of cracked fruit, and artificial methods of ripening, ii, 333.
Soil and manure for, i, 171, ii, 332; chemical manure, &c., used by market-growers, ii, 333, 334.
Culture in pits and frames—disadvantages of and treatment of plants, ii, 340.
Culture under glass—
Arrangement for culture in mixed houses—merits and defects of, ii, 334, 336.
Autumn and winter crops (see that sub-heading).
Border- and ridge-grown plants—soil and manure, ii, 336, 337; mulchings, ii, 337; planting, pruning and training, ii, 338, 339.
Pot-grown plants (illustr.) for early supplies—general treatment, soil, position in house, pruning and training, &c., ii, 335, 336.
Setting the flowers and removal of misshapen fruit, ii, 336, 338.
Successional supplies and early crops—means of obtaining and treatment of plants, ii, 335, 336-338.
Temperature and ventilation, ii, 336, 338.
Disease—liability of plants to, ii, 334, 336; effect of mulching, ii, 338; treatment of scalding, ii, 338, 341, of potato disease, ii, 338, 340, of yellow spot, ii, 340, 341, of sleeping disease, i, 124, ii, 341, of black stripe, black rot, slime fungus, ii, 341.
Extent of culture, uses of tomatoes as articles of diet, origin of the tomato, ii, 330.
Foreign names of, ii, 528.
Insect pests—treatment of root-gall or eel-worm, wire-worms, &c., ii, 341, 342.
Late crops (see sub-heading Autumn and winter crops).
List of vars.—descript. and illustr., ii, 342, 343.
Manure, effect of—experiments on plants cultivated with and without manure, i, 171. (See also sub-headings Culture.)
Packing—methods of, ii, 380, 567; boxes, baskets (illustr.), &c., for, ii, 369, 371, 372.
Propagation methods, ii, 339.

Tools, Instruments, &c., for gardens—
Choice and care of—general remarks, i, 173.

Tools, Instruments, &c. (cont.)—
Instruments for cutting—descript. and illustr., i, 178-181.
Instruments used in laying out ground lines, i, 181-184.
Machines, hose-pipes, barrows, &c.—descript. and illustr., i, 184-190.
Miscellaneous articles—tallies, labels, tying materials, &c.—descript. and illustr., i, 194-196.
Spraying fruit-trees (see that title).
Tools—descript. and illustr., i, 173-178.
Utensils—pots, watering-cans, tubs, &c.—descript. and illustr., i, 190-194.
[For special tool, instrument, machine, &c., see its name.]

Torenia—calendrical directions, i, 6, 10, 12; descript. and cult., i, 556.

Torreya—species, &c., descript. of trees and fruit of, i, 334, 335.

Town trees and shrubs—(see title Sea-side and Town Trees and Shrubs).

Toxicophlæa (Acokanthera) spectabilis—as a stove shrub, i, 556.

Tracheids—(illustr.), formation of, i, 28.

Trachelium cœruleum—as a greenhouse plant, i, 543.

Trachycarpus—descript., cult., and illustr. of palms, i, 323, 324, 608, 612, 643.

Tradescantia—species, &c., descript. and cult., i, 375.

Tragopogon porrifolius—(illustr.), descript., uses, and cult., ii, 509, 510.

Training fruit-trees—(see names of fruits, sub-headings Pruning and training, or Culture, &c.).

Training plants—consideration of mode of growth, i, 46.

Trama troglodytes—descript. and remedies, i, 109.

Transplanting Trees, Shrubs, &c.—
Bearing the operation and need for transplanting, capabilities of plants, i, 247.
Dibbling as a mode of, for small plants, i, 177.
Frequent transplanting of young trees and plants—advantages of, i, 248.
Hole into which plant is to be placed—size, &c., i, 250.
Large trees, trench system—descript. and illustr. of, i, 249, 250, 251.
Machines and implements used—descript. and illustr., i, 249-251.
Season for—question as to best time, seasons for deciduous trees, shrubs, and evergreens, i, 247, 248.
Soil around plant-roots—importance of conveying without breakage, i, 249.
Supports against wind, &c., i, 251.

Trapa natans—descript. of, i, 384.

Trays for fruit-gathering and storage—descript. and illustr., ii, 69, 70, 382, 383.

Tree creepers (Birds)—as garden friends, i, 118.

Tree-ferns—conservatory decoration, potting, &c., directions, i, 527; *Lomaria gigantea*, descript. of, i, 595; *Blechnum* and *Dicksonia* genera—descript. of, i, 590, 593, illustr. of *D. squarrosa*, i, 592; use, cult., and species for subtropical garden, i, 641, 642, 643.

Tree-guards—guard used in Paris streets, i (illustr.), 338; for fruit-trees (illustr.), ii, 38.

Tree of Heaven—descript. of, i, 287.

Tree pæonies—(see *Pæony*).

Tree primrose—descript., uses, cookery, and cult. as vegetable, ii, 519; foreign names of, ii, 528.

Tree-pruner—(illustr.), descript. and use of standard, i, 180.

Tree-saws—descript. and use of, i, 181.

Tree tomato—descript., cult., and illustr., i, 534.

Trees and Shrubs—
Age of—means of calculating, i, 37.
Disease and insect pests (see titles *Fungi*,

Trees and Shrubs (cont.)—
Insect and other Plant Enemies, Spraying Fruit-trees).
Estates—plantation of timber on, i, 273, 274.
Flower-gardens and pleasure-grounds (see that title, sub-heading Trees and Shrubs).
Forcing shrubs (see title Forcing).
Greenhouse plants—descriptive list and illustr., i, 528-544.
Hardy ornamental (see titles Hardy Trees and Shrubs; Conifers, Hardy; Sea-side and Town Trees and Shrubs).
Leaves—table showing amount of nitrogen contained in, i, 138.
Manure injurious to evergreen shrubs—question of, i, 274.
Shelter-belts for orchard and kitchen-garden, planting (illustr.), ii, 10, 11, 33.
Storm damage—treatment of trees after, i, 252, 253, 254.
Subtropical garden (see that title).
Water-bank plantations—trees and shrubs for, i, 281, 282, 283, 378.
Wild garden—trees and shrubs suitable for, i, 284, 348.
[See also titles Propagation, Pruning, Spraying, Transplanting, &c.; for particular genus of tree or shrub, see its title.]

Trellis for fruit, &c., culture—construction of (illustr.), ii, 167, 320, 326.

Trianea bogotensis—descript. and cult., i, 384.

"Tribe"—botanical meaning of term, i, 66.

Trichomanes—descript. and cult. of stove and greenhouse ferns, and for Warden cases, i, 585, 601, of hardy fern *T. radicans*, i, 608.

Trichopilia—descript. of orchids, i, 581.

Tricuspidaria (Crinodendron) dependens—descript., cult., and illustr., i, 543.

Trillium—species, &c., descript. and cult., i, 375.

Triphæna pronuba—(illustr.), descript. and remedies, i, 111.

Tritoma—(see *Kniphofia*).

Tritonia—calendrical directions, i, 18; descript. and cult. of hardy perennial *T. aurea*, i, 376, of popular garden plants (illustr.) for indoor or outdoor cult., and list of species and vars., i, 517.

Trochilium myopæforme, T. tipuliforme—(illustr.), descript. and remedies, i, 112, 113.

Troglodytes europæus—as a garden friend, i, 119.

Trollius—species, &c., descript. and cult., i, 376, for planting near water, i, 387.

Tropæolum—ornamental plants, descript. and cult. of perennial species, &c. (illustr.), i, 376, of annual forms, i, 399, for summer-bedding, i, 637; *T. majus* and *T. tuberosum* (illustr.) for culinary purposes—descript., uses, and cult., ii, 467, 519.

Tropical plants and house—(see titles Stove or Tropical House and Plants, Subtropical Garden; also generic names of plants).

Trowel—(illustr.), descript. and use of, i, 175, 177.

Truck basket—(illustr.), descript. and use of, i, 189.

True-service tree—descript. of, i, 315.

Truffle—(illustr.), descript., where grown, and use as vegetable, ii, 520; foreign names of, ii, 528.

Trumpet flower—descript. of, i, 323.

Tsuga—species, &c., descript., cult., and classification of, i, 335.

Tuber æstivum—(illustr.), descript. and uses of, ii, 520.

Tuberoses—calendrical directions, i, 3, 9, 10, 14, 16, 18; forcing directions, i, 627.

Tubers—formation of (illustr.), i, 36; propagation by, i, 227.

Tubs for plants—(illustr.), descript. and use of, i, 192.

Tulip—

Calendarial directions, i, 3, 6, 14, 17, 18, 20.
Forcing sorts and directions, i, 627.

Popular garden plants—descript. and history, i, 517; cult. and lists of species (illusts.) of Tulipa and best garden tulips, i, 518, 519; florists' or English tulips (illust.), treatment and division into groups, i, 519, 520.

Spring-bedding sorts, selections for flowering together, &c., i, 631.

Tulip tree—descript. of, i, 307.

Tulipa—(see *Tulip*).

Tunica saxifraga—descript. and cult. of, i, 376.

Tupidanthus calypttratus—for the subtropical garden, i, 646.

Turf—

Burnt—analysis of ashes, and use of as manure, i, 164.

Lawns—method, &c., of laying turf, i, 278, 280.

Turf-beetle—(illust.), descript. and use of, i, 175, 177.

Turf-scraper—descript. and use of, i, 176.

Turf-spade—(illust.), descript. and use of, i, 176.

Turkey's beard—descript. and cult. of, i, 377.

Turnip—crops turnips may follow and be succeeded by, ii, 391; seed quantities, ii, 391; descript. of common, French, and Swedish turnips, ii, 520; soil, manure, and general cult., ii, 520; forcing directions, storing the roots, saving seeds, ii, 521, 568; list (illusts.) of vars., ii, 522; disease (see Anbury disease); foreign names of, ii, 528; calendarial directions, ii, 533, 536, 539; 542, 544, 546, 548, 550, 552; packing, ii, 568.

Turnip cabbage—(see *Kohl Rabi*).

Turnip-fly—(illust.), descript. and treatment, i, 96, 97.

Turnip gall weevil—(illust.), descript. and treatment, i, 101.

Turnip sawfly—(illust.), descript. and treatment, i, 97.

Tutsan plant—descript. of, i, 305.

Tydaea—(see *Isoloma*).

Tying materials used for garden purposes, i, 196.

Tylenchus—(illust.), descript. and remedies, i, 107, 108; ii, 342.

Typha angustifolia and other species—descript. and uses of, i, 384.

U

Undea (Montanoa) bipinnatifida—for the subtropical garden, i, 646.

Ulex europæus, **U. nanus**—descript. and cult. of, i, 324.

Ulmus—species, &c., descript. of, i, 324.

Ulua stridula—as garden friend, i, 118.

Umbellularia californica—descript. and cult., i, 324.

Urceolina aurea—as a stove plant, i, 556.

Urine—as a manure, i, 160.

Ursinea pulchra—descript. and cult. of, i, 399.

Utensils used for garden purposes—descript. and illusts., i, 190-194.

Utricularia—descript. and cult., i, 556.

V

V-moth—(illust.), descript. and treatment, i, 98.

Vaccinium—descript. and cult. of hardy ornamental species, &c. (illust.), i, 324, of *V. Myrtillus* (illust.) for the cult. of bilberry fruit, ii, 272, 273.

Valeriana Phu-aurea—for spring-bedding, i, 631.

Valerianella—species used as vegetables—descript., illust., and cult., ii, 439.

Vallisneria spiralis—descript. and cult., i, 384.

Vallota—calendarial directions, i, 14; descript., illust., and cult. of, i, 520.

Vanda—calendarial directions, i, 4, 7, 15, 16; species, &c., descript. and illust., i, 581, 582.

Vanellus cristatus—as garden friend, i, 117.

Vaporizer, hand—(illust.), descript. and use of, i, 188.

Vaporizing fumigator—(illust.), descript. and use of, i, 189.

Vapourer moth—(illust.), descript. and treatment, i, 97.

"Variety"—botanical meaning of term, i, 66.

Vascular plant—descript. of, i, 29.

Vases—garden decoration, i, 268; flower-vases (illusts.)—forms and materials used, i, 651-653; arrangement of flowers in (illust.), i, 648, 652-655.

Vegetable marrow—descript., illust., general cult., and market-grower's plan, ii, 522-524; ornamental uses of, ii, 524; forcing and fruiting on beds, &c., ii, 524; foreign names of, ii, 528; calendarial directions, ii, 542; packing, ii, 568.

Vegetable mould—(see titles *Humus*, *Soils*—sub-heading *Horticulture*).

Vegetable physiology—influence of potash on, i, 169, 170.

Vegetables—

Calendarial directions (see title *Calendar of Operations in the Fruit- and Kitchen-gardens*).

Cropping the kitchen-garden—necessity and rules for rotation, merits of modes of cropping, ii, 389, 390; lists of crops to follow each other, ii, 390, 391; quantities of seed required, ii, 391.

Foreign names of—lists giving English, French, and German titles, ii, 527-530.

Hybridization— isolation and self-fertilization to fix varieties, i, 62.

Improvements due to judicious cross-fertilization and hybridization, i, 59.

Orchard plantations—illusts., &c., of plans for culture of vegetables in, ii, 37, 38, 73, 75.

Packing and storing vegetables (see title *Packing vegetables*).

Preserved—import returns for 1899, ii, 344; dried vegetables—French and German trade, ii, 353, directions for drying various vegetables, ii, 356, illusts. of appliances, ii, 45, 357, 359, 360.

Retarding growth—process of, i, 628.

Soil suitable for (see *Soils*—sub-heading *Fruit- and Kitchen-garden*).

Supply of, to an establishment—area of ground required to supply a regular allowance of vegetables, ii, 4, 5.

[For special vegetable, see its name.]

Vegetative sports—(see *Sports*).

Veins of leaves—descript. of, i, 39.

Venetian Sumach—descript. of shrub, i, 317.

Venidium calendulaceum—descript. and cult. of, i, 399.

Venus's looking-glass—descript. and cult. of, i, 399.

Venus's navelwort—descript. of, i, 397.

Veratrum—species, &c., descript. and cult., i, 376.

Verbascum—species, &c., descript. and cult., i, 376.

Verbena—calendarial directions, i, 9; descript. and cult. of lemon-scented verbenas, i, 307, in greenhouse, i, 537; annual species, &c., descript. and cult., i, 399, summer-bedding kinds (illust.) and directions, i, 633, 637.

Verbesina gigantea—for the subtropical garden, i, 646.

Verge-cutter—(illust.), use of, i, 175, 176.

Veronica—calendarial directions, i, 9; descript. and cult. of hardy ornamental species, &c. (illust.), i, 324, of hardy perennial species, &c. (illust.), i, 377, of greenhouse plants, i, 544, of plants for carpet- and winter-bedding, i, 640, 647.

Verschaffeltia splendida—descript. and cult. of, i, 612.

Vespa crabro—as garden friends, i, 120.

Vespa vulgaris—damage to fruit, remedies, i, 78.

Vessels—formation of spiral and annular (illust.), i, 28.

Viburnum—calendarial directions, i, 18; descript. and cult. of hardy ornamental species, &c. (illust.), i, 325, of greenhouse species, i, 544, of forcing plants (illust.), i, 625, of winter-bedding plants, i, 647.

Vicia Faba—descript. and origin, ii, 403; cult. (see *Beans*).

Victoria regia—illust. of, i, 380; descript. and cult., i, 384.

Villarsia nymphæoides—descript. of, i, 384.

Vinca—descript. and cult. of hardy ornamental species, &c., i, 325, of *V. rosea* as stove plant, i, 556, of plants for spring- and winter-bedding, i, 631, 647.

Vine louse—(illust.), descript. and treatment, i, 109, 110.

Vine mildew—(illusts.), causes and treatment, i, 126, 128; ii, 290; fungicide for, i, 129; sulphurator (illust.) used in remedy of, i, 189, 190.

Vine scale—descript. and treatment, i, 70.

Vineries, Construction of—

Aspect suitable for vineries, i, 205.

Border formation (see *Vines*, sub-heading *Culture under glass*).

Covenfords vineries—descript. of, i, 206.

Drainage, ii, 280.

Form of structures (illusts.)—merits of span-roof, lean-to roof vineries, &c., i, 205, 206; ii, 280.

Hot-water pipes and ventilation arrangements, i, 206.

Vines—Culture for Fruit—

Culture in pots—merits of, ii, 289; raising and growing from eyes, directions for potting, temperature, soil, pruning, training, and disbudding, ii, 289; fruiting vines and means of ensuring even break of buds, fertilization of flowers, ii, 289, 290; thinning the fruit and illust. of pot-grown plant, ii, 290.

Culture outdoor—against walls, &c.—

Conditions necessary to, ii, 291.

Illust. and descript. of Lord Bute's vinery, ii, 293, 294.

Planting, pruning and training (illust.), ii, 292, 294, 556.

Soil and situation, ii, 292.

Thomery and Fontainebleau systems—descript. of, ii, 292, 293; merits for adoption in England, ii, 293, 294.

Culture under glass—

Borders—formation (illust.) and drainage, ii, 280, 281; soil preparation, ii, 281; renewal of borders and of surface soil, ii, 282; manures for, ii, 282, 284; protection measures, ii, 282; watering, ii, 283.

Calendarial directions, ii, 534, 537, 539, 542, 544, 547, 549, 551, 553, 554, 557, 559.

Construction of vineries (see title *Vineries*).

Foliage and roots—growth of and the maintenance of healthy state of vine, ii, 285.

Forcing—time to start houses for various crops, ii, 282.

Keeping the grapes on the vines and when cut—directions and illust., ii, 288.

Lifting vines for renewal of border and as restorative to weak vines, ii, 282.

Mode of bearing fruit—(illust.), descript. of growth and management of young shoots, ii, 284, 285.

Vines—Culture for Fruit (*cont.*)—

Culture under glass (*cont.*)—

Planting—time and methods (illustr.), ii, 281; young green vines, ii, 282; distances to plant, ii, 282; treatment after planting, ii, 284.

Pot culture (see sub-heading Culture in pots).

Pruning and training—methods and merits of long-rod, extension, spur (illustr.) systems, ii, 285, 286; disbudding, stopping the shoots, ii, 286, stopping young growing vines, ii, 284.

Setting the flowers—"free-setters" and "shy" setters (illustr.) and artificial means of setting, ii, 286, 287; cause and treatment of sterility, ii, 287.

Stimulants—use of liquid and artificial manure, directions for making a stimulant, ii, 284.

Temperature and ventilation, ii, 283.

Thinning the fruit (illustr.), ii, 287, 288.

Watering and syringing, ii, 283.

Descript. and origin of *Vitis vinifera*, history of vine-culture and descript. of various old and large existing vines, ii, 279, 280.

Diseases—cause and treatment of shanking, rust, and scalded grapes (illustr.), ii, 290, 291; vine mildew (see that title).

Insect, &c., pests—descript. and treatment of vine scale, vine louse, i, 70, 109, 110; list of insect pests, ii, 291.

List of vars.—descript., cult., and illustrs., ii, 296–301; selections for special purposes, ii, 301.

Manure—composition of special manure, i, 169; chemical ingredients required by fruit, leaves, and stem—table showing, i, 169; value of potash as manure, i, 140, 168, 169. (See also sub-headings Culture.)

Movement of liquids in plants—explanation of "vine-bleeding", i, 44.

Packing and storing the grapes (see Grapes).

Propagation by seeds, cutting, eyes (illustr.), ii, 294, by layering, grafting (illustr.), and inarching (illustr.), ii, 295, 296.

Soil suitable—importance of potash in, i, 140; analysis of soil from Spain, composition of soil suitable for vines—tables showing constituents, i, 140, 141. (See also sub-headings Culture.)

Vines—greenhouse evergreen vines, descript. and cult., i, 544.

Vines—hardy ornamental species, &c., descript. of genus *Vitis*, i, 325, 326.

Viola—calendarial directions, i, 6, 8, 13, 14, 16, 17, 20; species, &c., descript. and cult., i, 377; plants for spring- and summer-bedding, i, 631, 632; popular garden plants (see titles *Viola tricolor*, *Viola*).

Viola tricolor—descript., history, cult., and list of sorts of show and fancy pansies (illustr.), i, 520, 521, of bedding viola or tufted pansy (illustr.), i, 521, 522.

Violet ground beetle—(illustr.), as a garden friend, i, 115, 116.

Violets—calendarial directions, i, 3, 5, 6, 9, 14, 16, 17, 18, 20; descript. and cult. of hardy perennial viola species, &c., i, 377, of water violets, i, 381, of spring-bedding sorts, i, 631; popular plants (see *Violets—Viola odorata*).

Violets (*Viola odorata*)—general cult., and in frames and pots; list of vars. and treatment of insect pests and fungoid disease, i, 522, 523.

Virginian creeper—descript. and uses of, i, 228.

Virginian stock—cult. and descript., i, 14, 394.

Viscum album—descript. and cult. of, i, 325.

Vitex Agnus-castus—descript. and cult. of, i, 325.

Vitis—descript. and cult. of hardy ornamental species, &c. (illustr.), i, 325, 326, of greenhouse plants, i, 544, of *V.*

vinifera and the origin and history of vine culture, ii, 279. (See also titles *Ampelopsis*, *Vines*.)

Voiles—descript. and treatment, i, 104.

W

Wagtails—as garden friends, i, 118.

Wahlenbergia—species, &c., descript. and cult., i, 377.

Waldsteinia fragarioides—descript. and cult., i, 377.

Walking fern—descript. and illustr., i, 607, 608.

Walks, Formation of, &c.—

Flower-gardens, i, 258, 260, 263, 267.

Fruit- and kitchen-garden—materials used, cost of cement walks, &c., ii, 30–32.

Pleasure-grounds—(illustr.), i, 269, 271, 272.

Water-garden—drainage, &c., of walks in vicinity of, i, 282.

Wallflower—calendarial directions, i, 11, 13, 17; descript. and cult. of, i, 353, for spring-bedding, i, 631.

Wallchick—species of, descript., cult., and illustr., i, 612.

Walls—

Construction of garden walls (illustrs.)—

Colour, height, foundation, &c., i, 196–198.

Copings for walls, i, 198, 199.

Fruit- and kitchen-gardens (see that title).

Hollow walls and flued walls, i, 198, 199.

Fern-growing on walls of stove or greenhouse—directions, i, 585.

Old walls—plants suitable for covering, &c., i, 342, 353.

Walnut—

Cultivation—soil and situation, ii, 257; methods of planting, pruning, and propagation, ii, 258, 259; calendarial directions, ii, 533, 536, 554.

Descript. (illustr.) and history of the walnut, uses of wood and oil, and extent of import trade, ii, 257, 258.

Gathering, storing, and packing the nut—method of thrashing the tree, &c., ii, 258.

Insect pests—treatment of, ii, 259.

List of principal vars.—descript. and illustrs., ii, 259.

Pickling—use of fruit, ii, 257; time to gather nuts for, ii, 258.

Walnut trees—hardy ornamental species, &c., descript. of, i, 306; culture of fruit (see *Walnut*).

Warblers—as garden friends, i, 118.

Wardian cases—ferns suitable for, i, 585.

Washingtonia filifera—descript. and cult. of, i, 613.

Wasps—damage to fruit, remedies, i, 78; fig wasp, descript. and illustr., ii, 213, 214.

Water and Water-supply for Plants—

Ferns—stove and greenhouse, i, 583.

Flower-garden supply—provision for, i, 261.

Greenhouse and conservatory plants, i, 524, 583.

Hot water—mode of heating structures by, i, 216, 221.

Market-garden plantations—expenses and arrangements, ii, 78.

Nutrition of plants—soil as a source of, i, 41–43, 148, 149; absorption of water by root and leaf, i, 44; movement of liquid, i, 44.

Orchids, i, 560, 565, 566.

Ornamental water in pleasure-grounds (see that title).

Plants suitable for planting in or near water (see *Water-garden*).

Production of flowers—quantity needed, i, 49.

Soil and water—nutrition and oxidation, i, 134, 135; capillary power of soils, i, 135, 136.

Water and Water-supply for Plants (*cont.*)—

Stove or tropical plants, i, 546, 583.

Stream used for various purposes (see *Stream*).

Succulent plants, cacti, &c., i, 615, 616.

Watering instrument, utensils, &c. (see that title).

[For treatment of special fruit, see its title; plants, see generic titles.]

Water buttercups—descript. and uses of, i, 383, 385.

Water caltrops—descript. of, i, 384.

Water cress—packing, ii, 568; cult. (see *Cress*).

Water-cress fly—cocoons of on water-cress, treatment of, ii, 441.

Water-garden—

Formation and arrangement—use of cement tanks, drainage system (illustr.), &c., i, 378–380, ii, 21.

Hardy trees, shrubs, &c., suitable for planting on banks, i, 281, 282, 283, 378.

Illustrs. of ponds, bog garden, &c., i, 379, 380, 385.

[See also titles *Aquatic and Bog Plants*, *Ornamental Water*.]

Water hyacinth—descript., cult., and illustr. of, i, 383, 384.

Water lettuce—descript. and cult. of, i, 383.

Water-lilies—cultural requirements, i, 378–380; species, &c., descript., cult., and illustrs., i, 382, 383.

Water-pores of leaves—descript. and uses of, i, 41.

Water shield—descript. of plant, i, 381.

Water soldier—descript. of plant, i, 384.

Water-tanks—position, construction, &c., of, i, 378, 544.

Water violet—descript. of, i, 381.

Watering Instruments, Utensils, &c.—

Engines, hand and barrow (illustr.)—descript. and management of, i, 186, 187.

Hose-pipes and sprinklers (illustr.), descript. of, i, 185, 186.

Sprayers for distribution of insecticides—illustr. and use of, i, 188.

Spraying fruit-trees (see that title).

Syringes—(illustr.), descript. and use of, i, 190.

Vaporizer, hand—(illustr.), descript. and use of, i, 188.

Water-barrows—(illustr.), descript. and use of, i, 187.

Watering-cans—(illustr.), descript. and uses of, i, 193.

Wax-myrtle—descript. of, i, 310.

Wayfaring-tree—descript. of, i, 325.

Weasel—as garden friend, i, 122.

Weeder, dock—descript. and use of, i, 177.

Weevils—as plant enemies, descript. and treatment, i, 71, 77, 80, 83, 87, 89, 101, 109, 114.

Weigela—(see *Diervilla*).

Weighing-machines for fruit—descript. of, ii, 368.

Wheat crops—effect of mineral and nitrogenous manure, i, 144, 145.

Wheat-rust or mildew—formation of, i, 128.

Whin bushes—descript. and cult. of, i, 324.

Whip-stick fern of Australia—descript. of, i, 588.

White-beam tree—descript. of, i, 314.

White Portugal broom—descript. of, i, 298.

Wigandia caracasana (illustr.) and **W. Vigieri**—for subtropical garden, i, 646.

Wild Garden—

Art of wild gardening and meaning of term "wild garden", i, 347.

Formation of, i, 284.

Hardy trees, shrubs, and plants for—selection and arrangement, i, 284, 348.

Wild Garden (*cont.*)—
Narcissus culture in—directions and kinds suitable for, i, 472; illust. of, i, 470.
 Roseries (see *Rose-garden*).
Wild service tree—descript. of, i, 315.
Willow—species, &c., descript. of, i, 320, for subtropical garden, i, 641, for winter-bedding, i, 647.
Willow-herb—descript. and cult., i, 357.
Wind—
 Direction of—instructions for taking, i, 25.
 Plant nutrition—passage of fluids influenced by, i, 45.
 Shelter of kitchen-garden from—means for, ii, 10, 11.
Wind-flower—descript., cult., and illust. of, i, 400, 401.
Wineberry, Japanese—(illust.), descript., uses, and cult. of, ii, 271.
Winter Aconite—descript. and cult., i, 358.
Winter-bedding—directions and list of plants suitable, i, 646, 647.
Winter buds—growth of, i, 46.
Winter cherry—descript. and cult. of bush, i, 542.
Winter cress—descript. and cult. of, i, 399.
Winter moth—(illust.), descript. and treatment, i, 98.
Wire for floral decoration—kinds of and method of using, i, 649.
Wireworms—(illust.), descript. and treatment, i, 110, 111, on tomatoes, ii, 342, on asparagus, ii, 396.
Wistaria—descript. and cult. of hardy species, &c., i, 326; forcing *W. chinensis*, directions and illust., i, 625, 626.
Witch-hazel—descript. of shrub, i, 304.
Witsenia corymbosa—as a greenhouse plant, i, 544.
Weberian tortrix—(illust.), descript. and treatment, i, 70.
Wood and wood-fibres—formation of (illusts.), i, 28, 35, 36, 37.
Wood-ashes—as manure, i, 163.
Wood leopard moth—(illust.), descript. and remedies, i, 114.
Wood-lice—(illust.), descript. and treatment, i, 99.

Wood-lily—descript. and cult. of, i, 375.
Woodpeckers—as garden friends, i, 118.
Woodsia—species, &c., descript. of, i, 608.
Wood sorrel—descript., uses, and cult., ii, 524; foreign names of, ii, 528.
Woodwardia—descript. of stove and greenhouse ferns, i, 601, of hardy ferns, i, 608, of *W. radicans* for subtropical garden, i, 646.
Wood-wool for packing—price and use of, ii, 374, 383.
Woollen refuse and shoddy—as manure, i, 158.
Workmen—market-gardening, availability and employment of men, ii, 73, 74, 75; packers of fruit, employment and duties of, ii, 367.
Wormia Burbidgei—as a stove shrub, i, 556.
Worms—worm-casts on lawns, precautions against, i, 279. (See also *Wireworms*.)
Wormwood—(illust.), descript., uses, and cult. of common, Roman, and sea wormwood, ii, 525; foreign names of, ii, 528.
Wreaths and crosses—instructions for making, i, 651, illusts. of, i, 655.
Wren—as garden friend, i, 119.
Wulfenia—species, &c., descript. and cult., i, 377.

X

Xanthoceras sorbifolia—descript. of, i, 326.
Xanthosoma Lindenii—as a stove plant, i, 554.
Xanthosoma robustum and **X. violaceum**—for subtropical garden, i, 646.
Xeranthemum annuum—descript. and cult. of, i, 399.
Xerophyllum asptodeloides—descript. and cult., i, 377.

Y

Yeast of Gluten—descript. of fungus, i, 100.

Yellow aphid—(illust.), descript. and treatment, i, 73, 74.
Yellow hammer—as a garden friend, i, 116.
Yellow spot disease on tomatoes—descript. and treatment, ii, 340.
Yellow Sultan—descript. of plant, i, 390.
Yellow-tail moth—descript. and treatment, i, 99.
Yellow underwing moth—(illust.), descript. and remedies, i, 111.
Yellow-wood tree—descript. of, i, 296.
Yellows disease on peach and nectarine—descript. and treatment, ii, 179.
Yew trees—species, &c., descript. and uses of, i, 333; stinking yews, i, 334; winter-bedding vars., i, 647.
Yucca—species, &c., descript., cult., and illust., i, 326; *Y. recurva* for vases, &c., in spring-bedding, i, 631; terrace-garden plants, i, 641.

Z

Zamia—species, &c., descript. and cult., i, 613, 615.
Zauschneria californica—(illust.), descript. and cult., i, 377.
Zea—descript. and cult., i, 646; *Z. Mays* (illust.)—descript., use as vegetable, and cult., ii, 448, 449.
Zelkova crenata—descript. of, i, 326.
Zenobia speciosa—descript. of, i, 327, for forcing, i, 625.
Zephyranthes—descript. and cult. of hardy species (illust.), i, 377, 378, of greenhouse species, i, 544.
Zeuzera Esculi—(illust.), descript. and remedies, i, 114.
Zinna—descript., cult., and illust. of, i, 399.
Zoospores—formation and functions of, i, 65.
Zootoca vivipara—as garden friend, i, 119.
Zygomorphic flowers—descript. of, i, 50.
Zygopetalum—calendrical directions, i, 2, 8, 16, 18; species, &c., descript. of, i, 581, 582.

THE GRESHAM PUBLISHING COMPANY

34 SOUTHAMPTON STREET, STRAND, LONDON, W.C.

* * * * *

A NEW CENTURY: A NEW ENCYCLOPEDIA

The New Popular Encyclopedia.

A LIBRARY IN ITSELF. A General Dictionary of Arts, Sciences, Literature, Biography, and History. Edited by CHARLES ANNANDALE, M.A., LL.D., Editor of Ogilvie's "Imperial Dictionary of the English Language". Profusely illustrated. In 14 handsome volumes, super-royal 8vo, in Roxburgh library binding, 12s. 6d. per volume, net.

A New Century demands a New Encyclopedia. As time advances, knowledge increases. To sum up that knowledge a new Encyclopedia is required, and everyone ought to possess that new Encyclopedia.

The Gresham Publishing Company, having acquired exclusive control of the well-known POPULAR ENCYCLOPEDIA, are now issuing a **New and Revised Edition** of that famous authoritative work of reference.

The entire work has been revised to date under the editorship of **Dr. Charles Annandale**, assisted by a staff of **Specialists and Encyclopedic Experts.**

The **New Popular Encyclopedia** is a worthy successor to the previous edition, which numbered among its contributors men of the high position of LORD KELVIN, SIR ANDREW C. RAMSAY, PROFESSOR J. D. EVERETT, MR. COMYNS CARR, CAPTAIN ORD-BROWN, MR. M. M. PATTISON-MUIR, &c.

In the matter of **pictorial illustration** the New Popular Encyclopedia is *alone of its kind*. In no British Encyclopedia, not even in previous editions of the POPULAR, has so extensive a use been made of the pictorial arts to assist the elucidation of the subject-matter. In addition to the large number of **plates in colour**, there are very many plates in black and white: pictures of machinery-detail, portraits, ordnance such as Vickers, Creuzot, and Krupp guns, flying-machines, ethnological types, and the hundred-and-one different objects which can be rendered clearer by the use of pictorial illustration. A complete series of **Maps** is also provided.

The **Supplements** form a very special feature of the New Popular. Besides containing many articles on general subjects they give **biographies** of living men or of men recently deceased. Thus we have MR. CHAMBERLAIN, MR. KRUGER, LORD SALISBURY, LORD ROSEBERY, MR. ARTHUR BALFOUR, MR. GEORGE WYNDHAM, LORD ROBERTS, GENERAL BULLER, MAJOR-GENERAL BAOEN-POWELL (whose brother, Major Baden-Powell, secretary of the Aeronautical Society, contributes the Article on Aeronautics), &c., &c.

"THE NEW POPULAR ENCYCLOPEDIA" is a perfect library in itself, superseding, practically, the necessity of having recourse to a large number of books on different topics, and furnishing, at moderate cost, a complete body of information on all subjects.

IT IS A UNIVERSAL GAZETTEER, giving accounts of the natural and political divisions, countries, cities, rivers, lakes, &c., throughout the world.

IT IS A UNIVERSAL HISTORY, in which are to be found full general accounts of all the countries of the world, with important events and details treated at length under specific headings.

IT IS A BIOGRAPHICAL DICTIONARY—giving the lives of all important historic characters, statesmen, lawyers, literary men, scientists, inventors, engineers, artists, musicians, theologians, &c.

IT IS A COMMERCIAL DICTIONARY, explaining economic principles, treating fully the practical details of the chief industries, and giving elaborate accounts of manufacturing processes.

IT IS A DICTIONARY OF THE SCIENCES—Students of natural history, botany, geology, astronomy, chemistry, &c., will find an ample general record of modern progress in the special sciences.

IT IS A DICTIONARY OF THE FINE ARTS, explaining the technical terms, theories, and processes, and giving a historic and biographical record of the various branches of the Arts.

"THE NEW POPULAR ENCYCLOPEDIA" is, moreover, a Dictionary of the Practical Arts and Handicrafts, of Law, Medicine, Household Matters, Education, Music, Games, and Sports.

Prospectus of any Book post free.

The Household Physician.

A Family Guide to the Preservation of Health and to the Domestic Treatment of Ailments and Disease. By J. M'GREGOR-ROBERTSON, M.B. C.M. (Hon.). With an Introduction by Professor M'KENDRICK, M.D., LL.D., F.R.S., Glasgow University. Illustrated by about 400 figures in the text, and a Series of Engraved Plates. In 14 parts, super-royal 8vo, at 2s. each; or in 4 divisions, cloth, at 9s. net each; also in 1 volume, Roxburgh binding, £1, 13s. net; 2 volumes, ditto, £1, 17s. net.

One aim of this book is to supply in as plain language as can be used some knowledge of what science has to say as to the body which we inhabit; the second aim is to give reliable assistance in the domestic treatment of simple ailments. The bodily ills to which young and old are liable are considered more fully than is usual in popular works.

The first portion of the book treats of the human body in health, and the various changes produced by disease. This part has been divided into sections, each section being devoted to one set of organs. For example, the bones and joints are considered in one section, the nervous system in another, the digestive organs in a third, and so on. The first half of each section describes the particular organs in their healthy condition, and the second half discusses the diseases to which they are liable. By this method the healthy and diseased states of each part of the body are placed in relationship to, and mutually explain, one another. This section, moreover, contains special chapters on the MANAGEMENT OF CHILDREN IN HEALTH, the DISEASES OF CHILDHOOD, and the DISEASES OF WOMEN.

The second portion of the book is devoted to HYGIENE, or the conditions of health as regards FOOD, DRINK, CLOTHING, EXERCISE, &c., and the rules to be observed for the promotion of health, both of individuals and communities. Details are given of the requirements of a HEALTHY HOUSE, in its construction, ventilation, water-supply, drainage, &c.

In the third portion of the work the nature and mode of ACTION OF DRUGS and other remedial agents are explained. But this part includes more than mere drugs. ELECTRICITY, an agent as valuable in medicine as it is in commerce, and MASSAGE, or medical rubbing, another new and formidable antagonist to ill-health, will also be fully treated.

In the remaining portion of the book the methods of dealing with ACCIDENTS AND EMERGENCIES find a place, and the commoner SURGICAL INSTRUMENTS are described and their mode of use explained; SICK-NURSING receives attention, and recipes for INVALID COOKERY and Notes of MEDICAL PRESCRIPTIONS are given.

The ILLUSTRATIONS are very numerous, consisting of about four hundred figures printed in the text, and a series of thirty-one engraved plates, many of which are in colours.

A GREAT HISTORICAL WORK.

A History of the Scottish People.

From the Earliest to the Latest Times. By Rev. THOMAS THOMSON and CHARLES ANNANDALE, M.A., LL.D. With 40 Original Designs by W. H. MARGETSON, ALFRED PEARSE, WALTER PAGET, GORDON BROWNE, and other eminent artists. In 19 parts, super-royal 8vo, 2s. net each; or 6 divisional volumes, cloth elegant, 8s. 6d. net each.

The main features may be stated as follows:

It is a full and detailed History of Scotland from the Earliest Times to the Latest.

It is a History of the Scottish People, their manners, customs, and modes of living at the various successive periods.

It is a History of Religion and Ecclesiastical Affairs in Scotland.

It is a History of Scotland's progress in Commerce, Industry, Arts, Science, and Literature.

It is illustrated by a series of original designs reproduced in facsimile from drawings by eminent artists.

Prospectus of any Book post free.

IMPORTANT NEW EDITION.

The British Empire: AN ACCOUNT OF ITS ORIGIN, PROGRESS, AND PRESENT POSITION. With full Descriptions of Canada, Australia, South Africa, India, and other Colonies and Dependencies. By EDGAR SANDERSON, M.A.(Cantab.), author of "History of the British Empire", "Outlines of the World's History", &c., &c. Beautifully illustrated throughout with full-page drawings by the most eminent artists. *New Edition.* Greatly enlarged, and brought down to the beginning of the reign of King Edward VII. In 6 volumes, cloth elegant, olive edges, 9s. each, net.

With the accession of His Majesty King Edward the Seventh a new reign and a new century begin together. The occasion is almost unique, and we cannot doubt that the present time will be regarded as one of the outstanding landmarks in British history. It becomes therefore our duty and our pleasure, as responsible citizens of a mighty Empire, to take stock of our present position in the world, and prepare ourselves for the Era that is now opening by studying the successes and the failures of the past. Only by this means can we hope to keep our leading place among the great nations of the earth.

In the lamented death of Queen Victoria the mother-country and her colonies were united as they had never been before by the bond of a common sorrow; in the great Boer war they learned to recognize a common Imperial interest. It may be said that the events of the past two years have taught us for the first time in our history the true meaning of the phrase "**a British citizen**".

It is to assist the home and colonial reader in obtaining a comprehensive view of the Empire at large that the present work has been prepared. It claims to give a comprehensive account of the growth of the Empire from its very small beginnings to the magnificent inheritance which it has now become our duty to preserve.

The excitement caused by the Boer War will not soon be forgotten; but many of the important incidents of the campaign, coming as they did so thick and fast, and told only in scrappy and often conflicting newspaper reports, will inevitably escape the memory. It is an important feature of the present work that it gives not only a compendious history of the Empire, but a detailed account of the Boer war. In an interesting history of South Africa the author traces the events that led up to the war, gives graphic descriptions of the various **sieges and reliefs, marches and engagements**, thrilling **tales of personal bravery**, with many amusing and interesting anecdotes, and sketches the **careers of the prominent men** on both sides. This section of the work is illustrated with portraits of the British Generals, and with a large number of stirring and realistic war pictures.

The **startling developments** that have recently taken place in China have been given due attention, and the author clearly describes the foreign relations in that part of the world up to the present time.

Canada, India, the Australian Commonwealth, New Zealand, Africa—these are the big areas which are painted with British red on the world's map. But this same colour is dotted all over the globe; and the reader will find a full account of every colony, possession, and dependency where flies the Union Jack in this comprehensive history and picture of "Greater Britain".

The wonderful tale of our progress in the United Kingdom receives full justice and is not less interesting, embracing as it does the civil and military history of our country, the reform-legislation, the foreign policy of Britain, and the chequered history of Ireland from 1801 till 1896. While the narrative deals, for the most part, with the nineteenth century, a thoroughly interesting account of Great Britain in the eighteenth century is also presented.

The following are some of the subjects which are treated in great detail:—

Engineering.	Science.	Great Industries.
Moral and Social Advance.	Thrift.	Great Explorers.
Romantic Events.	Postal Reform.	Railways.
Commerce.	Electricity.	Banking.
Art.	Literature.	Shipping.

In the treatment of his subject the author has sought to avoid the dry details of a formal history, and to present in an entertaining narrative the gradual expansion of the British Empire, and its position at the present day. Such a book is invaluable to the scholar, the trader, those who have kin beyond the sea, and the general reader, and must prove of the deepest interest from beginning to end, written as it is in a vivid and vigorous style.

Prospectus of any Book post free.

The Home Teacher:

A CYCLOPEDIA OF SELF-INSTRUCTION. Edited by SAMUEL NEIL, Author of "Culture and Self-Culture", "Art of Reasoning"; Editor of the "Cyclopedia of History", &c. &c. Copiously illustrated with full-page plates, and engravings in the text. In 5 volumes, imperial 8vo, in handsome cloth cover, price 7s. net each. In complete sets only.



ALL THOUGHTFUL PERSONS have come to see that the most urgent need of the day is thorough and wide-spread education. Much will probably be done by public authorities to render more efficient, and more generally available, the means of popular education. But there are, and must always be, thousands, and these numbering among them many of the brightest intellects of their time, whose occupations compel them to rely mainly upon home study for further progress on the road to knowledge.

To such persons THE HOME TEACHER brings opportunities of self-culture which it would be hard for them otherwise to obtain, for the vast majority of people have not the time to work out courses of study for themselves; they do not know what books to read, and they would expend more time than they have at disposal in merely finding out how to make use of the library. But here comes THE HOME TEACHER to the assistance of such people; a compendium of courses of study in the most important branches of human knowledge; a

library that is easy of reference and always available.

THE HOME TEACHER will be of practical assistance to you whatever walk in life you may be pursuing. If you are engaged in business in any capacity, you ought to know French or German or both, for want of knowledge of which we are daily being "cut out" by the Germans. THE HOME TEACHER provides complete courses of study in these languages, and in the history and literature of both countries. *Book-keeping* also you should know thoroughly. Many a man has foundered in business for want of a knowledge of this essential art, who by study of the course in THE HOME TEACHER might have averted disaster. *Shorthand*, too, is of the greatest value in business, and can be learned from THE HOME TEACHER. If you are in a trade, a knowledge of the scientific basis of your trade is important to you, and will help you to step up into the ranks of the leaders. For instance, to builders, engineers, carpenters, a knowledge of Mechanics is all-important. Miners ought to know Geology. Chemistry enters into a multitude of crafts. THE HOME TEACHER gives complete courses in these various Sciences as well as others, such as Physics, Botany, Physiology, Astronomy, &c.

A well-stored mind unable to express itself may be excelled by one less well-stored but trained in neat expression. Ability to write well is not a gift of nature. It is only acquired by study and practice of Composition and of Grammar, and in THE HOME TEACHER these subjects are fully treated.

THE HOME TEACHER unlocks the storehouse of English literature, introducing the student to what is greatest and best in the language, and gives valuable courses of study in history and geography. For those who are musically inclined it provides instruction in music, and for the artistic a graduated series of drawing lessons.



THE HOME TEACHER does not concern itself solely with educating the mind. It designs also to provide instruction in *physical training* of the body, a section being specially devoted to such sports as have been found of the greatest value in the development of a sound mind in a healthy and vigorous body.

As a general book for the household there could hardly be one more valuable than THE HOME TEACHER. It fulfils many of the purposes of an illustrated Encyclopedia, and in its great number of illustrations gives pictorial representations of much that could not otherwise be made clear.

It is a perfect *Library for Home Study*. Indeed it might not inappropriately be called *The University at Home*, for it brings right to the home what is best in the Universities, namely the essence of the books there collected.



Bookbinding a Speciality.

Dickens' Novels.



The Imperial Edition of the Novels of CHARLES DICKENS, in 15 volumes, large square 8vo, cloth extra, gilt top, price 4s. 6d. net each volume.

An Ideal Issue. ONE NOVEL, ONE VOLUME. Despite varying lengths, the paper, &c., is so adjusted that each volume is uniform in thickness and size.

The Cheapest Edition. The price of each volume is 4s. 6d. nett, making the edition the *cheapest of the best editions*.

Sumptuously Bound. The cloth is of the finest and is imperial red in colour. The embellishments (produced in gold) are an appropriate design of national arms and imperial emblems by the eminent designer, Talwin Morris.

Illustrations a Unique Feature. Every picture drawn specially at enormous cost for this "Imperial" edition by the best known and most celebrated Artists of *to-day*.

George Gissing's Masterly Study. A literary character study, the work of this great authority, forms one of the volumes of this issue, and is illustrated with pictures of some of the quaint old hostelrys and places made famous by Dickens, and is altogether an invaluable addition to this issue.

Presentation Portrait. To every subscriber to this edition will be presented with the last volume a magnificent Photogravure of Charles Dickens. It is printed on the finest plate paper, 22 inches by 30 inches, and has been specially engraved for this edition.

A List of the Novels.

The following is a list of the volumes in the Imperial Edition:—

1. The Pickwick Papers.
2. Oliver Twist.
3. Nicholas Nickleby.
4. Martin Chuzzlewit.
5. The Old Curiosity Shop
6. Barnaby Rudge.
7. David Copperfield.
8. Bleak House.
9. Sketches by Boz.
10. Hard Times and Master Humphrey's Clock.
11. Christmas Books.
12. Dombey and Son.
13. Little Dorrit.
14. A Tale of Two Cities.
15. Charles Dickens: A Critical Study.

By GEORGE GISSING.



Prospectus of any Book post free.

NEW EDITION, REVISED AND GREATLY AUGMENTED.

Ogilvie's Imperial Dictionary OF THE ENGLISH LANGUAGE. A complete Encyclopedic Lexicon, Literary, Etymological, Scientific, Technological, and Pronouncing. Edited by CHARLES ANNANDALE, M.A., LL.D. Illustrated by above three thousand engravings on wood, besides a series of finely engraved and coloured plates. This edition of the IMPERIAL DICTIONARY is beautifully printed on paper of imperial size, specially made for the Work. It is issued in eight Divisional Volumes of a handy size for reference, bound in cloth, with a fine design on side, at 10s. nett each volume; also in 20 Divisions, paper cover, at 3s. each, net.

The reception accorded by the press and the public to this new edition of the IMPERIAL DICTIONARY has been such as to show that the care and labour bestowed upon it have met with due recognition, and to prove that it will continue fully to maintain its established position as a standard lexicon of the English language, and as a work of the highest utility for the purposes of general reference and everyday requirement.

DISTINCTIVE POINTS.

To sum up the chief points of this edition—

- I. It is the latest revised dictionary, and has a supplement of many thousand new words.
- II. It contains more words, exclusive of compound and obsolete words, than any other English dictionary.
- III. The pronunciation is explained on a plan which is simplicity itself.
- IV. It gives the pronunciation and the meaning of the word as recognized *to-day*.
- V. It has more illustrations than any other English dictionary.
- VI. It has full-page plates (coloured and otherwise), which are an outstanding feature of the work. No other English dictionary contains full-page plates.
- VII. It has clear type, beautifully printed on fine paper, and is substantially and elegantly bound.
- VIII. It has a specially prepared Supplement issued with *each* volume, and not, as is usually the case, relegated to the end of the complete work.
- IX. It has a very full Appendix, probably the best and finest given with any dictionary in the world.
- X. It is sold on a plan at once acceptable and convenient, within the reach of all, and the price is very moderate.

"The IMPERIAL DICTIONARY", says the *St. James' Gazette*, "is a work which fairly deserves the epithet of monumental. It is really what it professes to be—'a complete encyclopædic lexicon, literary, scientific, and technological'. In other words, it is the best dictionary of its kind in the English language, and its kind is the best."

"We have no hesitation in saying", writes the *Spectator*, "that it will prove a most thorough piece of workmanship, and that among reference-books of its class it will hold the first place, both as an authority and a source of instruction and entertainment."

"The encyclopedic method of treatment which has been adopted", remarks the *Athenæum*, "will be found of the greatest service, affording as it does to the reader the advantages of the ordinary dictionary combined with those of the encyclopedia."

The *St. James' Gazette* says:—"The encyclopædic part is executed with great skill and accuracy; and the genius of the editor has been exercised with the power and precision of a hydraulic press upon the enormous masses of facts with which he has had to deal".

Bookbinding a Speciality.

The Book of the Home.

AN ENCYCLOPÆDIA OF ALL MATTERS RELATING TO THE HOUSE AND HOUSEHOLD MANAGEMENT. Produced under the general editorship of H. C. DAVIDSON, assisted by over one hundred specialists. Copiously illustrated by coloured and black-and-white plates and engravings in the text. In 4 volumes, super-royal 8vo, cloth, with artistic design, price £2, 2s. net. Also in 8 divisional volumes, cloth, price 5s. net each.

THE BOOK OF THE HOME is intended to form a complete work of reference on all subjects connected with household management. No efforts have been spared to ensure that every matter bearing upon the Home and Home Life shall receive full and sufficient treatment, and that the information given shall be reliable and in the best sense of the phrase up-to-date.

A few among over one hundred specialists who have contributed to the work:

Mrs. ADA S. BALLIN, Editor of *Baby—the Mother's Magazine*, and of *Womanhood*.
Miss BERTHA BANNER, Training Teacher of Sewing and Dressmaking at the Liverpool Technical College for Women.
Mr. A. BLACK, C.E., Architect, Author of *First Principles of Building*.
Mrs. DAVIDSON, Author of *Dainties, What our Daughters can do for themselves*, &c.
Miss J. FORSTER, Principal of the Cheshire County Council Dairy Institute.
Mrs. H. R. HAWES (the late), Author of *The Art of Decoration, The Art of Beauty*, &c.
Miss HELENA HEAD, Principal of the Liverpool Girls' School for Secondary Education in Domestic Science, and Author of the *Manual of Housewifery*.
Mrs. A. HODGSON, Home Decorator to *The Lady*.
Mr. R. KEITH JOHNSTON, Author of *Household Difficulties and How to overcome Them*.

Miss GERTRUDE J. KING, Secretary to the Society for Promoting the Employment of Women.
Miss E. E. MANN, Head Teacher at the Liverpool Training School of Cookery.
Colonel M. MOORE-LANE, Contributor to the *Field* and other agricultural papers.
Mrs. C. S. PEEL, Dress and Household Editor of *Hearth and Home*, and Author of *The New Home*.
Miss B. SIBTHORPE POOLEY, Lecturer to the Liverpool Ladies' Sanitary Association.
Miss RANKIN, Head Teacher of Laundry Work at the Liverpool Technical College for Women.
Miss FLORENCE STACPOOLE, Lecturer to the National Health Society and the Councils of Technical Education, and Author of *Handbook of House-keeping for Small Incomes*, &c.
Mr. DAVID TOLLEMACHE, late editor of *The Chef and Connoisseur*.

The contents of THE BOOK OF THE HOME may be grouped under four heads. The first deals with all matters concerning the House—from the choice of its site to the least of its internal decorations. The householder is instructed in the laws regarding landlord and tenant, and counselled in the important matters of sanitation and ventilation, heating and lighting, and the stocking and management of the garden. The housekeeper is advised as to furnishing, everything necessary for the comfort and adornment of a well-equipped house being described in detail, hints being also given regarding removals, painting and papering, artistic decoration, arrangement of linen and store cupboards, &c.

In the second the daily routine of the Household is considered—the duties of the servants, their wages, their leisure and pleasures, the management of the kitchen, laundry, and store-room. Plain and fancy cooking receive due attention, recipes being given of a large variety of dishes, and suggestions made for breakfast, lunch, afternoon-tea, dinner, and supper. A number of menus are added suitable for the different seasons. Invalid cookery also has its special section.

In the third are discussed the legal and customary duties, and the occupations and pastimes, of Master and Mistress, the former being instructed as regards insurance and the making of a will, and the smaller matters of carving, the care of the wine-cellar, and the inspection of garden and stables, while the latter is advised as to account-keeping, payments, shopping, and innumerable other matters connected with her duties as Mistress. Other subjects treated under this head are dress, home occupations, visiting and entertaining, and indoor and outdoor amusements.

In the fourth sound, systematic, and practical advice is given as to the management, in health and sickness, and the education, of children, and also on such important subjects as occupations for boys and girls, the ceremonies necessary on the coming out of a daughter, and the preparations and formalities necessary before and after a marriage.

THE BOOK OF THE HOME will thus be at once an indispensable ally to the young bride and the novice in housekeeping, and a valuable work of reference to the more experienced.

Prospectus of any Book post free.



The Gresham Library of Standard Fiction.

and containing a biographical sketch of the author. Large crown 8vo. Price 3s. 6d. net each.

The novels of the Gresham Library of Standard Fiction are all "old, tried, and valued friends": books to read, books to keep and read again, books to hand down from generation to generation. Breezy historical tales, recalling, like *Westward Ho!* the stirring days and valiant deeds of old; witty social satire like *Pride and Prejudice*; tales of quiet heroism like *John Halifax*; weird tales of mystery like *After Dark*; intimate studies of the human soul like *Jane Eyre*—here are books for all tastes.

CHARLOTTE BRONTË
Jane Eyre. Illustrated by JOHN H. BACON.
WILLIAM MAKEPEACE THACKERAY
The Newcomes. Illustrated by WILLIAM RAINEY, R.I.
CHARLES KINGSLEY
Westward Ho! Illustrated by WILLIAM RAINEY, R.I.
EDWARD BULWER, Lord Lytton
The Caxtons. Illustrated by JOHN H. BACON.
CHARLES DICKENS
David Copperfield. Illustrated by WILLIAM RAINEY, R.I.
SIR WALTER SCOTT, Bart.
The Heart of Midlothian. Illustrated by CLAUDE A. SHEPPERSON.
JANE AUSTEN
Pride and Prejudice. Illustrated by CHRIS. HAMMOND, R.I.
CHARLES LEVER
Harry Lorrequer. Illustrated by CARTON MOORE PARK.
MRS. CRAIK
John Halifax, Gentleman. Illustrated by JOHN H. BACON.

BENJAMIN DISRAELI, Lord Beaconsfield
Coningsby. Illustrated by CLAUDE A. SHEPPERSON.
WILKIE COLLINS
After Dark. Illustrated by GORDON BROWNE, R.I.
NATHANIEL HAWTHORNE
The Scarlet Letter, and The House with the Seven Gables. Illustrated by JOHN H. BACON.
GEORGE BORROW
Lavengro. Illustrated by CLAUDE A. SHEPPERSON.
MRS. GASKELL
Cranford, and Mary Barton. Illustrated by CHRIS. HAMMOND, R.I.
MARIA EDGEWORTH
Ormond. Illustrated by FRED. PEGRAM.
JAMES MORIER
Hajji Baba. Illustrated by H. R. MILLAR.
ANTHONY TROLLOPE
Barchester Towers. Illustrated by L. LESLIE BROOKE.
GEORGE ELIOT
Scenes of Clerical Life. Illustrated by CHRIS. HAMMOND, R.I.

Bookbinding a Speciality.

